Federal Communications Commission
Washington, D.C. 20554

FROM: **Wireline Competition Bureau**

RE: **Peer Review of *Empirics of Business Data Services* White Paper by Dr. Marc Rysman (April 2016); *Business Data Services in an Internet Protocol Environment; Investigation of Certain Price Cap Local Exchange; Carrier Business Data Services Tariff Pricing Plans; Special Access for Price Cap Local Exchange Carriers; AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, WC Docket Nos. 16-143, 15-247, 05-25, RM-10593.**

DATE: **June 28, 2016**

On May 2, 2016, the Federal Communications Commission (Commission) released a Tariff Investigation Order and Further Notice of Proposed Rulemaking in the business data services (special access) rulemaking proceeding.[1] The item included a white paper prepared by an outside econometrician hired by the Commission, Dr. Marc Rysman, entitled "Empirics of Business Data Services" (Rysman Paper).[2] The Rysman Paper "studied the market for business data services in the United States," analyzing data collected by the Commission from providers and purchasers of business data services.[3] The Commission sought comment on the validity and strength of Dr. Rysman's analysis and conclusions, and on their relevance to the Commission's analysis, and this proceeding more generally.[4]

Consistent with Office of Management and Budget (OMB) peer review guidelines,[5] the Commission also initiated an external peer review of the Rysman Paper, seeking the analysis of Andrew Sweeting, Associate Professor of Economics, University of Maryland, and Tommaso Valletti, Professor of Economics, Imperial College London.[6] The Commission subsequently received written peer review reports from Professors Sweeting and Valletti analyzing the Rysman Paper.[7]

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[1] *See Business Data Services in an Internet Protocol Environment Investigation of Certain Price Cap Local Exchange Carrier Business Data Services Tariff Pricing Plans; Special Access for Price Cap Local Exchange Carriers; AT&T Corporation Petition for Rulemaking to Reform Regulation of Incumbent Local Exchange Carrier Rates for Interstate Special Access Services*, WC Docket Nos. 16-143, 15-247, 05-25, RM-10593, Tariff Investigation Order and Further Notice of Proposed Rulemaking, FCC 16-54 (rel. May 2, 2016) (*Business Data Services Order* or *Business Data Services FNPRM*).

[2] *Id*., Appx. B, Dr. Marc Rysman, *Empirics of Business Data Services* (Apr. 2016) (Rysman Paper).

[3] The data collected in 2015 is primarily from 2013. *Id*. at paras. 36-37.

[4] *Id*. at para. 164.

[5] Final Information Quality Bulletin for Peer Review, Office of Management and Budget, Executive Office of the President, 70 Fed. Reg. 2664 (Jan. 14, 2005) (requiring that influential scientific information on which a federal agency relies in a rulemaking proceeding be subject to peer review to enhance the quality and credibility of the government's scientific information).

[6] *See* Memorandum from Mathew S. DelNero, Chief, Wireline Competition Bureau, to Andrew Sweeting, Associate Professor, University of Maryland (Apr. 14, 2016), http://www.fcc.gov/encyclopedia/peer-review-agenda; Memorandum from Mathew S. DelNero, Chief, Wireline Competition Bureau, to Tommaso Valletti, Associate Professor, University of Maryland (Apr. 14, 2016).

[7] Andrew Sweeting, University of Maryland College Park, "Review of Dr. Rysman's 'Empirics of Business Data Services' White Paper (Apr. 16, 2016) (Sweeting Report), https://www.fcc.gov/general/peer-review-agenda; Letter

Professor Rysman has made revisions to his paper (namely further explanations and clarifications) in response to these peer review reports, which the Commission submits into the record of the proceeding as well as the Commission's peer review agenda website.[8] Separately, attached are three Commission staff papers responding to specific comments from the peer reviewers. Attachment 1 addresses suggestions to explore the use of clustered standard errors.[9] Attachment 2 addresses Professor Valletti's request for a discussion on the interpretation of results of pricing flexibility regulatory framework biases by analyzing the extent to which the effects of facility-based competition vary by regulatory type – price cap (only), Phase I pricing flexibility, and Phase II pricing flexibility.[10] Attachment 3 further addresses the competitive effect of cable network infrastructure.

Additionally, there were some notable comments and suggestions by the peer reviewers, as noted below, that Professor Rysman and Commission staff took under consideration but that did not result in revisions to the Rysman Paper and were not otherwise specifically addressed by Commission staff in Attachments 1 and 2.

- Professor Valletti indicates that it would be useful to know how many customers are multi-location. He then notes that if customers have "a preference for a single provider, or cross deals are difficult to reach across locations, then it would be possible to argue that the finding that there is little potential competition would be further reinforced."[11] We find that 19.2% of customers are located in more than one building. We agree that a better understanding of the preferences of customers will shed additional light on competition in business data service markets.

- Professor Sweeting proposes that "[i]f any terms and conditions are available, one should analyze how they differ, within a census tract or county, with the level of competition, and ideally, additional controls for terms and conditions should be included in regressions."[12] As a first response, the Rysman Paper points out that terms and conditions are endogenous, and thus may be chosen so that lower priced services are more attractive to purchasers that have competitive alternatives, hence the approach taken by Professor Rysman did not seek to control for these. Nonetheless, Commission staff agrees that controlling for as many characteristics of a connection as possible is worth investigating. The data collected by the

from Tommaso Valletti, Professor of Economics, Imperial College London, to Matthew DelNero, Chief, Wireline Competition Bureau (dated Apr. 28, 2016) (Valletti Report), https://www.fcc.gov/general/peer-review-agenda.

[8] *See* Dr. Marc Rysman, *Empirics of Business Data Services* (Apr. 2016, rev. June 2016) (Revised Rysman Paper); FCC Peer Review Agenda, https://www.fcc.gov/general/peer-review-agenda. In addition, some formatting changes were made (e.g., page numbering added), and some minor non-substantive changes were made to Tables 1-4 (e.g., changed from reporting by millions to billions in Tables 1 and 3, the revenues for Level 3 and tw twlecom and for Birch and Cbeyond were combined in Table 2, and a number was rounded in Table 4).

[9] *See* Sweeting Report at 10-11; Valletti Report at 7; Attach. 1, FCC Memorandum, "Use of Clustered Standard Errors in Business Data Service Regressions" (June 10, 2016).

[10] Valletti Peer Review Report at 6; Attach. 2, FCC Memorandum, "Distinguishing the Effects of Competition on ILEC Prices under Price Cap only Regulation, Phase 1 Pricing Flexibility, and Phase II Pricing Flexibility" (June 10, 2016).

[11] Valletti Report at 4.

[12] Sweeting Report at 5, 11-12.

Commission contains a limited amount of information on term and volume commitments for use with regressions. Preliminary analysis by the Commission of the regressions in the Rysman Paper indicate that controlling for the presence of term and volume commitments has minor effects on the estimated impact of competition on ILEC prices and does not change the interpretation of our results in the Rysman Paper.

- Professor Valletti cautions about the possible endogeneity of the degree of pricing flexibility and its effect on the results of Table 20, and by extension, the attached Commission staff memorandum on distinguishing the effects of competition on ILEC prices under the different pricing flexibility regimes.[13] He indicates that unless flexibility was granted randomly the results are biased. He believes that it is likely that pricing flexibility was granted in locations where the Commission did not expect prices to rise. We agree with Professor Valletti that we should consider how the mechanisms by which flexibility was granted will influence the regression results. We note that under Professor Valletti's proposed mechanism our estimates of the effect of competition on prices in locations with pricing flexibility would likely understate the effect on competition on prices in areas that do not currently have pricing flexibility.

- Professor Sweeting suggests in considering whether estimated effects of competition are "implausibly large" that the analysis account for "the size of the coefficients alongside engineering-based estimates of the costs and margins involved in providing BDS services."[14] Commission staff agree with Professor Sweeting's assessment that such an approach would bolster findings on the estimated effects of competition. However, the Commission has no engineering-based estimates of the cost and margins involved in providing business data services, and, do not consider obtaining such estimates to be feasible.

- Professor Sweeting, noting the distinct impacts of customer type on purchase prices found in the Rysman Paper, recommended additional regressions, one for each customer type.[15] Commission staff are investigating this and related strategies for evaluating the impacts of competition on different customer groups.

- Professors Sweeting and Valletti suggest using panel data.[16] The data collected for analysis is for a single year, 2013, so panel data was unavailable for the analysis. Professor Rysman does note that if he had panel data, it would be interesting to study how a competitive providers entered one building in a block and then spread to others but that the results suggest that distinguishing between competition in the building and the block is not particularly important.[17] As part of the underlying rulemaking proceeding, the Commission is also considering the collection of data periodically going forward, which would result in panel data.

[13] Valletti Report at 6.

[14] *Id*. at 10.

[15] *Id*. at 11.

[16] Sweeting Report at 4; Valletti Report at 6.

[17] Revised Rysman Paper at 25 n.43.

ATTACHMENT 1

Use of Clustered Standard Errors in Business Data Service Regressions

Federal Communications Commission Staff[1]

June 28, 2016

Professor Marc Rysman's White Paper, "Empirics of Business Data Services" (Rysman Paper), suggests that future work should include the use of clustered standard errors. Both peer reviews concur on this suggestion. In this memo, we explain the purpose behind so-called clustered standard errors and then re-estimate the regression tables from the Rysman Paper.

What are referred to as clustered standard errors are standard errors calculated under less restrictive assumptions than basic standard errors and so-called robust standard errors. With basic standard errors it is assumed that the error terms of the regression model are independent and identically distributed. The identical distribution assumption requires that the error terms be homoscedastic, in other words have the same variance. This assumption can be relaxed by calculating what are commonly called robust standard errors.[2] This estimate of the standard error retains the assumption that the error terms are independent, however, it allows for the relaxation of the homoscedasticity assumption. Clustered, or cluster-robust, standard errors further relax the assumptions about the distribution of error terms by allowing the error terms to be correlated within defined groups of observations. However, the error terms of observations from different groups are assumed to be independent.

These assumptions are issues because the researcher does not know the true properties of the distribution of error terms. If the assumptions about the error terms do not hold, the estimated standard errors, and consequently all hypothesis tests, may have a significant bias. The degree of the bias depends on a number of factors including the amount of intra-group correlation and the size and number of the groups.

The first step in correcting for the potential bias is to determine the groups within which the error terms may not be independent. Such a lack of independence is generally caused by unobserved factors that vary between groups but have the same influence within the group. In the case at hand we can think of several possible factors. Those factors may be associated with the location, the carrier, and the customer. Professor Andrew Sweeting's peer review suggests the census block containing the location as the most natural way to cluster. This unit has the added benefit of clustering together circuits sold by the same carrier as well as a good number of circuits purchased by the same customer in the location.[3] These are likely sources of correlation in the error terms, though the correlation is due to a misspecified model rather than correlation in the underlying distribution of the error terms. We therefore used the census block as the clustering group for the calculation of standard errors.

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[1] We acknowledge and appreciate Tracy Waldon, FCC Economist, for his contributions to this paper.

[2] They are also known as heteroscedasticity-robust standard errors, Huber-White standard errors, sandwich-estimated standard errors, among others.

[3] Using census blocks as the group variable also helps reduce the bias in the standard error estimate by using a large number of groups and not having any single group account for more than 5% of the observations in the dataset.

In the tables that follow, we have replicated Tables 14 through 20 from the Rysman Paper and allowed for correlation in the error terms within census blocks. Use of the common method for calculating cluster-corrected standard error does not change the estimated coefficients; they remain consistent in the statistical sense. The cluster-robust standard errors are substantially larger than the robust standard errors of the original regressions. Despite this, in only a few cases do we find that there are significant changes in the interpretation of the regression results. In the tables that follow, we have highlighted the changes in the standard hypothesis tests on the competition variables. In many instances, even though the point estimates are quite large, they are measured with such imprecision that they are not statistically different from zero. The most extensive changes are found in Tables 16 and 19. Table 16 estimates the effect of having a competitor in the census block and splits that effect into an effect when a fiber network is also in the census block and when one is not. For the DS-1 regression using tract fixed effects, none of the competition variables are statistically different from zero. At first blush this might be considered as indicative that the presence of a competitor does not influence ILEC prices. However, looking at Tables 14 and 15, there is clear evidence that this is not the case. Furthermore, the parameter estimate in Table 16 of the competitive effect when a fiber network is present is close in magnitude to the estimates in Tables 14 and 15.[4] This is evidence that the regression specification in Table 16 is not accounting for any omitted variable bias. Consequently our conclusion is that Table 16 simply pushes the data far enough that we cannot reliably estimate the effect of competition. We would not conclude that there is no competitive effect in light of the findings in Tables 14 and 15, as well as other Tables, such as Table 20, in the Rysman Paper. In Table 19, the regression examining the influence of the numbers of competitors on DS-3 prices is significantly changed. There is minimal evidence that the number of competitors has an influence on ILEC prices for DS-3 services. Again, given the evidence we see in many other specifications, we do not believe that this result is definitive, but simply asks more of the data than it can provide.

Finally, one concern with having so many groups is the presence of singleton groups. A singleton group is a census block which only has one circuit in it. Such a group cannot be used to estimate the intra-group correlation. If these singleton groups constitute a significant portion of the groups such that we are estimating the intra-group correlation on a collection of groups that are geographically isolated, we would have concern that we may not have an unbiased estimate of the intra-group correlation in the entire population. We have examined this issue and find that generally at least 40% of the census blocks in the dataset are used to calculate the intra-group correlation parameter. These census blocks are widely distributed; more than 70% of counties and 90% of states are represented by these census blocks. We would therefore conclude that there are not any significant sources of bias in the estimation of the intra-group correlation parameter.

[4] 87% of DS-1 observations are in census blocks with fiber networks according to Attachment 3 of the Rysman Paper. Accordingly, most of the competitive effect in Tables 14 and 15 is being measured in census blocks with fiber networks.

Table 14a: Regression of Log Price on Competition in the Census Block (Table 14 in Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.032	-0.109	0.023	-0.056	-0.114	0.046
	(0.004)*	(0.042)*	(0.030)	(0.007)*	(0.035)*	(0.038)
Customer is a Telecommunications Provider	-0.196	-0.025	0.135	-0.131	0.014	0.146
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.201	0.148	0.199	-0.364
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.041)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.464	-0.055	-0.005	-0.472
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.008	0.031	-0.140	-0.023	0.070	-0.011
	(0.015)	(0.107)	(0.070)*	(0.010)*	(0.057)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.052	0.074	-0.082	0.113	0.123
	(0.022)	(0.148)	(0.105)	(0.014)*	(0.074)	(0.053)*
Natural Log of Employment in the Zip Code	-0.004	0.105	0.041	0.045	-0.181	-0.111
	(0.030)	(0.200)	(0.147)	(0.019)*	(0.106)	(0.069)
Natural Log of Number of Establishments in the Census Block (D&B)	0.011	-0.024	0.005	0.021	0.062	0.028
	(0.002)*	(0.025)	(0.013)	(0.004)*	(0.019)*	(0.014)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.045	-0.003	-0.030	-0.060	-0.042
	(0.001)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.531			-0.660
			(0.090)*			(0.088)*
Constant	5.513	5.762	5.757	6.202	6.471	6.293
	(0.088)*	(0.728)*	(0.511)*	(0.061)*	(0.309)*	(0.266)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	136.35	5.57	12.71	183.73	4.94	14.53
Observations	1,399,440	120,129	80,326	1,399,440	120,129	80,326

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 15a: Regression of Log Price on Competition and CLEC Network in the Census Block (Table 15 in Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.032	-0.108	0.025	-0.052	-0.104	0.054
	(0.004)*	(0.043)*	(0.030)	(0.007)*	(0.035)*	(0.039)
An Indep. CLEC Has a Fiber Network in the Census Block	-0.003	-0.016	-0.030	-0.046	-0.121	-0.073
	(0.004)	(0.047)	(0.030)	(0.007)*	(0.054)*	(0.047)
Customer is a Telecommunications Provider	-0.196	-0.025	0.136	-0.131	0.012	0.146
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.201	0.148	0.196	-0.364
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.464	-0.055	-0.006	-0.467
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.008	0.031	-0.140	-0.022	0.075	-0.010
	(0.015)	(0.107)	(0.070)*	(0.010)*	(0.059)	(0.043)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.051	0.075	-0.081	0.123	0.124
	(0.022)	(0.148)	(0.105)	(0.014)*	(0.074)	(0.053)*
Natural Log of Employment in the Zip Code	-0.004	0.104	0.040	0.045	-0.196	-0.111
	(0.030)	(0.200)	(0.147)	(0.019)*	(0.109)	(0.068)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.023	0.006	0.022	0.064	0.029
	(0.002)*	(0.025)	(0.013)	(0.004)*	(0.019)*	(0.014)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.045	-0.004	-0.030	-0.059	-0.042
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.531			-0.660
			(0.090)*			(0.088)*
Constant	5.515	5.776	5.785	6.222	6.539	6.338
	(0.088)*	(0.731)*	(0.513)*	(0.061)*	(0.314)*	(0.265)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	122.72	5.14	11.74	167.43	5.00	13.41
Observations	1,399,440	120,129	80,326	1,399,440	120,129	80,326

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 16a: Regression of Log Price on Competition interacted with the Presence of Fiber in the Block (Table 16 in Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.017	0.032	0.040	-0.016	-0.023	0.085
	(0.010)	(0.103)	(0.071)	(0.016)	(0.109)	(0.102)
An Indep. CLEC Has a Fiber Network in the Census Block	0.000	0.035	-0.028	-0.038	-0.090	-0.066
	(0.005)	(0.054)	(0.032)	(0.008)*	(0.067)	(0.051)
Ind. CLEC Fiber Network in CB x Facilities-based CLEC in Building in CB	-0.016	-0.151	-0.016	-0.039	-0.088	-0.033
	(0.011)	(0.109)	(0.075)	(0.017)*	(0.114)	(0.108)
Customer is a Telecommunications Provider	-0.196	-0.025	0.136	-0.131	0.011	0.146
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.201	0.147	0.194	-0.364
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.464	-0.055	-0.007	-0.467
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.009	0.033	-0.140	-0.022	0.078	-0.010
	(0.015)	(0.108)	(0.070)*	(0.010)*	(0.059)	(0.043)
Natural Log of Annual Payroll in the Zip Code	-0.015	-0.049	0.074	-0.079	0.128	0.125
	(0.022)	(0.148)	(0.105)	(0.014)*	(0.075)	(0.053)*
Natural Log of Employment in the Zip Code	-0.004	0.101	0.041	0.043	-0.204	-0.112
	(0.030)	(0.200)	(0.147)	(0.019)*	(0.110)	(0.068)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.024	0.006	0.022	0.064	0.029
	(0.002)*	(0.025)	(0.013)	(0.004)*	(0.019)*	(0.014)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.045	-0.003	-0.030	-0.059	-0.042
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.531			-0.659
			(0.090)*			(0.088)*
Constant	5.513	5.724	5.783	6.214	6.511	6.331
	(0.088)*	(0.731)*	(0.513)*	(0.061)*	(0.317)*	(0.265)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	111.67	4.72	10.84	152.55	4.51	12.42
Observations	1,399,440	120,129	80,326	1,399,440	120,129	80,326

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 17a: Regression of Log Price on Competition in the Building and the Block (Table 17 in Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Building	-0.047	-0.063	-0.023	-0.066	-0.047	-0.014
	(0.006)*	(0.047)	(0.038)	(0.011)*	(0.038)	(0.039)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.027	-0.118	0.053	-0.044	-0.124	0.062
	(0.006)*	(0.060)*	(0.034)	(0.009)*	(0.045)*	(0.032)*
Customer is a Telecommunications Provider	-0.197	-0.026	0.135	-0.132	0.012	0.147
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.057)*
Customer is a Mobile Telecommunications Provider	0.104	0.195	-0.201	0.149	0.198	-0.363
	(0.006)*	(0.050)*	(0.103)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.049	-0.462	-0.055	-0.005	-0.466
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.175)*
Natural Log of Establishments in the Zip Code	0.009	0.037	-0.143	-0.023	0.066	-0.007
	(0.014)	(0.108)	(0.070)*	(0.010)*	(0.056)	(0.043)
Natural Log of Annual Payroll in the Zip Code	-0.012	-0.020	0.064	-0.073	0.120	0.124
	(0.021)	(0.152)	(0.104)	(0.014)*	(0.073)	(0.054)*
Natural Log of Employment in the Zip Code	-0.008	0.067	0.054	0.037	-0.185	-0.114
	(0.029)	(0.205)	(0.146)	(0.018)*	(0.105)	(0.068)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.016	-0.000	0.021	0.071	0.022
	(0.002)*	(0.022)	(0.013)	(0.003)*	(0.019)*	(0.014)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.044	0.000	-0.028	-0.061	-0.037
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.197
			(0.051)*			(0.036)*
Packet-based Connection			-0.530			-0.658
			(0.088)*			(0.088)*
Constant	5.500	5.654	5.785	6.158	6.432	6.279
	(0.087)*	(0.732)*	(0.513)*	(0.060)*	(0.303)*	(0.273)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	125.17	4.50	11.87	165.83	4.50	13.65
Observations	1,399,440	120,129	80,326	1,399,440	120,129	80,326

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 18a: Regression of Log Price on Competition in the Building, the Block, and the Tract (Table 18 in Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Building	-0.051	-0.074	-0.026	-0.069	-0.049	-0.022
	(0.007)*	(0.048)	(0.038)	(0.011)*	(0.038)	(0.038)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.033	-0.136	0.049	-0.049	-0.126	0.058
	(0.007)*	(0.062)*	(0.035)	(0.009)*	(0.046)*	(0.032)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.030	-0.210	-0.039	-0.039	-0.036	-0.073
	(0.007)*	(0.074)*	(0.042)	(0.009)*	(0.046)	(0.049)
Customer is a Telecommunications Provider	-0.197	-0.025	0.135	-0.132	0.011	0.146
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.201	0.148	0.198	-0.366
	(0.006)*	(0.050)*	(0.103)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.049	-0.462	-0.055	-0.005	-0.470
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.175)*
Natural Log of Establishments in the Zip Code	0.008	0.039	-0.143	-0.025	0.065	-0.008
	(0.014)	(0.109)	(0.070)*	(0.009)*	(0.056)	(0.043)
Natural Log of Annual Payroll in the Zip Code	-0.011	-0.023	0.065	-0.065	0.126	0.135
	(0.021)	(0.153)	(0.104)	(0.014)*	(0.074)	(0.056)*
Natural Log of Employment in the Zip Code	-0.009	0.068	0.053	0.032	-0.189	-0.120
	(0.029)	(0.206)	(0.146)	(0.018)	(0.105)	(0.070)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.020	-0.001	0.021	0.070	0.021
	(0.002)*	(0.022)	(0.013)	(0.003)*	(0.019)*	(0.014)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.047	0.000	-0.027	-0.060	-0.036
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.530			-0.658
			(0.089)*			(0.088)*
Constant	5.525	5.860	5.815	6.141	6.425	6.264
	(0.087)*	(0.737)*	(0.513)*	(0.059)*	(0.304)*	(0.276)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	113.86	4.42	11.38	154.97	4.29	12.89
Observations	1,399,440	120,129	80,326	1,399,440	120,129	80,326

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 19a: Regression of Log Price on Number of Competitors in the Census Block (Table 19 in Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	DS-1 County FE	DS-3 County FE
A Facilities-based Competitor is in the Building	-0.048	-0.066	-0.065	-0.052
	(0.006)*	(0.046)	(0.011)*	(0.037)
One Facilities-based Competitor is in the Block But Not the Building	-0.018	-0.095	-0.028	-0.070
	(0.005)*	(0.070)	(0.009)*	(0.046)
Two or Three Facilities-based Competitors are in the Block But Not the Building	-0.051	-0.154	-0.075	-0.159
	(0.010)*	(0.070)*	(0.014)*	(0.058)*
Four or More Facilities-based Competitors are in the Block But Not the Building	-0.040	-0.132	-0.065	-0.280
	(0.025)	(0.092)	(0.025)*	(0.107)*
Customer is a Telecommunications Provider	-0.197	-0.025	-0.132	0.010
	(0.010)*	(0.043)	(0.012)*	(0.037)
Customer is a Mobile Telecommunications Provider	0.103	0.195	0.149	0.194
	(0.006)*	(0.050)*	(0.009)*	(0.041)*
Customer is a Cable Operator	-0.073	-0.049	-0.056	-0.010
	(0.009)*	(0.046)	(0.010)*	(0.047)
Natural Log of Establishments in the Zip Code	0.008	0.038	-0.025	0.063
	(0.014)	(0.110)	(0.009)*	(0.055)
Natural Log of Annual Payroll in the Zip Code	-0.008	-0.011	-0.068	0.144
	(0.022)	(0.155)	(0.014)*	(0.074)
Natural Log of Employment in the Zip Code	-0.011	0.057	0.034	-0.209
	(0.030)	(0.208)	(0.018)	(0.107)
Natural Log of Number of Establishments in the Census Block (D&B)	0.013	-0.014	0.023	0.080
	(0.002)*	(0.022)	(0.004)*	(0.020)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.043	-0.028	-0.060
	(0.002)*	(0.019)*	(0.002)*	(0.015)*
Constant	5.486	5.623	6.133	6.331
	(0.087)*	(0.741)*	(0.061)*	(0.307)*
Adjusted R-Squared	0.33	0.26	0.18	0.11
F Statistic	105.24	4.06	145.87	4.14
Observations	1,399,440	120,129	1,399,440	120,129

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 20a: Regression of Log Price on Competition in the Block, by Price Flex Regulation (Table 20 in Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	DS-1 County FE	DS-3 County FE
A Facilities-based Competitor is in the Census Block	0.001	0.125	-0.009	0.060
	(0.008)	(0.059)*	(0.017)	(0.052)
Phase 1 x Facilities-based Competitor in Census Block	-0.038	-0.337	-0.073	-0.221
	(0.010)*	(0.081)*	(0.021)*	(0.076)*
Phase 2 x Facilities-based Competitor in Census Block	-0.048	-0.265	-0.040	-0.191
	(0.013)*	(0.084)*	(0.022)	(0.065)*
Customer is a Telecommunications Provider	-0.196	-0.024	-0.130	0.013
	(0.010)*	(0.042)	(0.012)*	(0.037)
Customer is a Mobile Telecommunications Provider	0.103	0.195	0.148	0.200
	(0.006)*	(0.050)*	(0.009)*	(0.041)*
Customer is a Cable Operator	-0.073	-0.051	-0.054	-0.004
	(0.009)*	(0.046)	(0.010)*	(0.047)
Natural Log of Establishments in the Zip Code	0.009	0.038	-0.023	0.069
	(0.015)	(0.108)	(0.009)*	(0.057)
Natural Log of Annual Payroll in the Zip Code	-0.015	-0.038	-0.079	0.117
	(0.022)	(0.148)	(0.014)*	(0.074)
Natural Log of Employment in the Zip Code	-0.005	0.082	0.043	-0.185
	(0.030)	(0.201)	(0.019)*	(0.106)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.025	0.021	0.063
	(0.002)*	(0.025)	(0.004)*	(0.019)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.046	-0.030	-0.060
	(0.001)*	(0.019)*	(0.002)*	(0.015)*
Constant	5.511	5.772	6.189	6.467
	(0.088)*	(0.728)*	(0.061)*	(0.310)*
Adjusted R-Squared	0.33	0.26	0.18	0.10
F Statistic	112.41	6.12	155.33	4.68
Observations	1,399,440	120,129	1,399,440	120,129

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

ATTACHMENT 2

Distinguishing the Effects of Competition on ILEC Prices under Price Cap only Regulation, Phase I Pricing Flexibility, and Phase II Pricing Flexibility

Federal Communications Commission Staff[1]

June 28, 2016

This memo builds upon the analysis of Professor Marc Rysman's White Paper, "Empirics of Business Data Service" (Rysman Paper), in analyzing the extent to which the effects of facility-based competition vary, if at all, across the three types of regulatory treatment applied to DS-1 and DS-3 circuits (and any potential impacts on other less regulated business data services): price cap (only), Phase I pricing flexibility, and Phase II pricing flexibility. This memo considers the interacting indicator approach to this question found in the Rysman Paper (associated with Table 20) and investigates an alternative approach that separately analyzes the data for each regulatory regime. Using the interacting indicator approach, but with zip code business data controls that allow us to make use of more data, and allowing for cluster-robust standard errors, we find that competition in Phase II pricing flexibility areas has a statistically, and in many cases economically, significant effect on incumbent local exchange carrier (ILEC) prices for DS-1 and DS-3 circuits. However, we find little evidence that the presence of competition affects ILEC prices in price cap regions. The alternative method described in this memo comes to a similar conclusion. Our analysis also demonstrates that use of zip code business data controls appear to make use of the Dun & Bradstreet (D&B) business establishment data unnecessary. These conclusions further demonstrate the robustness of the Rysman Paper's findings of ILEC market power, and reinforce the likelihood that the Rysman Paper, where it does not account for the regulatory regime (Tables 14-19), understates the impact of competition on reducing ILEC prices (because it "averages" the price effects that largely appear to occur in Phase II price flexibility areas over all areas).

The Rysman Paper estimates the effect of the presence of facilities-based competition on the prices of ILEC business data services. The sample is broken into three categories, DS-1, DS-3, and connections of at least 45 Mbps, whether circuit- or packet-based, and competitive effects are estimated independently for each of these samples. The competitive effects reported in the Rysman Paper, Tables 14 through 19, are an average of the effects observed under three different regulatory treatments: price cap (only) regulation; Phase I pricing flexibility, which allows for contract tariffs; and Phase II pricing flexibility, which in addition to allowing contract tariffs, removes the price cap constraint. If ILEC price responses to competition do not vary across the three regulatory treatments, then the results reflect the expected ILEC response to competition everywhere. However, if ILEC price responses to competition do materially vary across the regulatory treatments, an average of these responses across the three treatments would mask these variations, and consequently could obscure significant policy implications. ILEC incentives and the ability to respond to competition likely do vary under these different regulatory regimes because ILECs face different constraints on their ability to set profit-maximizing prices in each regime. Because the different regulatory regimes are not well-linked to underlying levels of competition, there will be sufficient variation in the levels of competition within a regime to allow for the separate identification of competitive effects within each regime. Consequently, it is valuable to try and

[1] We acknowledge and appreciate Tracy Waldon, FCC Economist, for his contributions to this memorandum.

determine the extent to which the effects of facility-based competition vary, if at all, across the three types of regulatory treatment.

Several regression specifications allow estimation of separate competitive effects under each of the three different regulatory treatments. Table 20 in the Rysman Paper illustrates one such method. In addition to an indicator variable for the presence of a competitor in the census block, it includes two additional indicator variables, being an interaction between the first indicator, the presence of a competitor in the census block, and respectively indicators for Phase I and Phase II pricing flexibility. This allows for different competitive effects under the different regulatory treatments. Taking this approach, the Rysman Paper finds that the ILEC response to competition is stronger in pricing flexibility areas as compared to price cap areas. This response is indicative that in the absence of competition ILECs are able to charge higher prices for business data services under pricing flexibility than they are under price caps.

This approach using interactions can become cumbersome as the number of competition variables grows. Table 20 uses the same competition measures as Table 14 and the number of competition related variables increases from one to three. A specification such as Table 19 in the Rysman Paper would contain 12 parameters to interpret if interactions based on regulatory status were added. A specification such as Table 16 would contain interactions with interactions. Interpreting these specifications can become difficult and hypothesis tests cannot be easily presented to readers.

The Rysman Paper restricts the sample to Metropolitan Statistical Areas (MSAs), which is dictated by the use of the D&B data supplied by Compass-Lexecon. This has the effect of overweighting Phase I and II areas relative to price cap areas because, with the exception of West Virginia and Idaho, Phase I and II areas are restricted to MSAs while price caps are not. Demographics regarding the presence of businesses is important to have in the regressions as it influences both demand for and costs of business data services. Regressions using zip code demographics allows the use of the full range of data. This memo investigates the use of zip code demographics as the sole source of business density information, thereby expanding the geographic area covered by the regressions, but limiting the amount and precision of the demographic information.

The following sets of tables suggest a complementary framework that address these two issues. The tables follow those as presented in the Rysman Paper. Each table provides the original regression estimates using Census tract fixed effects from the Rysman Paper in the first column, though cluster-robust standard errors are used in accordance with the recommendations in the Rysman Paper as well as the peer reviewers. These regressions include business density controls using both the D&B data at the census block level and Census Bureau data at the zip code level. The second column, labeled "D&B Areas," removes the D&B business density data from the regression and modifies the Census Bureau data to better reflect the way in which business density is likely to affect business data service prices. Otherwise, the D&B Areas specification uses the same set of observations that are restricted to MSAs.[2] Comparing the first and second columns illustrates that the use of the D&B business density data has minor effects on the estimated competitive effects. The differences in the estimated coefficients on the competition variables are minor and only one coefficient changes from being statistically significant to

[2] We do not have surface area for a few zip codes to allow the calculation of business density in a zip code. We lose 275 out of 1.4 million observations in the DS-1 regression, 20 out of 120,129 observations in the DS-3 regressions, and 8 out of 80,326 observations in the high bandwidth regressions.

not statistically significant (*see* Table 17b). The third column, labeled "All Areas," expands the sample to include all available observations, in particular those outside of MSAs. There are material differences in the reported competitive effects in columns 2 and 3. This could arise because something that is related to Census Bureau's decision to give a territory MSA status is related to how firms compete, or because the regulatory status of the territories are systematically different. Because regulatory status has a direct effect on ILEC pricing decisions, it is likely to be the primary driver rather than MSAs. Columns 4, 5, and 6 of the tables explore this effect by separating the sample into observations in each of the three regulatory regimes: Price Cap Areas, Phase I Areas, and Phase II Areas.

There are advantages and disadvantages of using separate regressions for each regulatory area. A significant advantage is ease of interpretation. Rather than having a multitude of parameters to interpret and test one can quickly ascertain whether competition in an area has a statistically significant effect. In addition, separate regressions introduce more flexibility by allowing all of the remaining parameters on variables such as business density and customer types to also vary across the different regulatory areas. The disadvantage with separate regressions is that it is not possible to do a formal statistical test to compare competitive effects in one pricing regime to another.[3]

Tables 14a through 19c replicate the Rysman Paper tables. Sub-tables labeled (a), (b), and (c) cover DS-1, DS-3, and High Bandwidth connections respectively. Table 1 summarizes these regression results in terms of the effect of competition on ILEC prices. Examining the individual regression tables covering DS-1 it seems clear that the regressions in the Rysman Paper are dominated by the competitive effects in Phase II areas and rarely reflect the effect of competition in price cap areas. Consider table 14a for example. The Rysman Paper suggests that the presence of a competitor reduces ILEC DS-1 prices by 3.2%.[4] When the sample is expanded to cover all areas rather than just MSAs, the effect drops to -2.0%, as illustrated in the third column. As mentioned, bringing in observations from outside the MSA serves to increase the number of price cap observations. It is possible that the differences we are observing are due to regulatory status. Columns 4, 5, and 6 restrict the sample to price cap, Phase I, and Phase II regions, respectively. Table 14a shows that the effect of a competitor is -1.4% in price cap regions, -1.2% in Phase I regions, and -4.4% in Phase II regions. This is a clear indication that the effects in the Rysman Paper are driven by Phase II regions. Table 15a provides a nearly identical story in which the competitive effects in price cap and Phase I regions appear similar and substantially smaller than the effects in Phase II regions. Tables 17a through 19a support this story as well as providing some indication that the competitive effects may be steadily increasing as we move from price cap to Phase I to Phase II areas. Table 16a contains an interaction term between the presence of competition and the presence of a fiber network. This makes interpretation more complicated. Competition appears to have an effect on ILEC prices in Phase II areas only when a fiber network is present in the census block, while

[3] This same argument holds for the choice to use separate regression equations for DS-1 and DS-3 circuits. It is not possible to formally conduct a statistical test on the differences between competitive effects on DS-1 circuits and DS-3 circuits, though with the use of interaction terms we could estimate the competitive effects jointly and conduct such a test.

[4] As discussed in the Rysman White Paper at footnote 36, the estimated coefficients on the indicator variables for competition cannot be strictly interpreted as a percentage change. However, to assist the lay reader in following along with the discussion of the results presented in the tables, I will interpret the estimated coefficients as percentage changes. Readers interested in greater precision can apply the transformation $\%\Delta = e^{\beta} + 1$ where β is the estimated coefficient, to obtain one estimate of the percentage change in prices due to competition.

in price cap and Phase I areas the presence of a fiber network does not matter. However, it is the case that in the presence of a fiber network, the competitive effects in Phase II areas are stronger than in price cap and Phase I regions.

The results for DS-3 circuits are similar to those for DS-1 circuits. The Rysman Paper estimates of the competitive effects are largely driven by Phase II areas. When separated out into specific regulatory regimes, the pattern observed in estimated competition parameters in the DS-3 regressions suggest that ILEC market power is steadily increasing with pricing flexibility, however quite commonly the competitive effects in price cap and Phase 1 areas are not statistically different from zero. Consider tables 14b and 15b. The presence of a competitor in price cap areas is associated with DS-3 prices that are 5.5% to 6.0% higher than those in areas without competition, though not statistically different from zero. In a Phase I area, prices in areas with and without competition are 1.7% to 2.8% lower than in areas without competition, though again not statistically different from zero.[5] While in Phase II areas, competition appears to lower prices by approximately 21% and is statistically significant. This pattern continues in tables 16b through 19b.

With respect to high bandwidth connections, the Rysman Paper results appear to be much more of a true average of the three regulatory areas. While there are differences in the competitive effects between regulatory regimes, there is little indication of the presence of market power. Nearly all coefficients on competition are not statistically different from zero.

The separate regressions of tables 14a through 19c provide a means of examining differential competitive effects by regulatory regime. The alternative is to use interaction terms to estimate the effect. Table 20 uses this method. It presents results for DS-1 and DS-3 circuits for all regions in columns 3 and 6, respectively. Interaction terms can be difficult to interpret. The effect of competition in price cap areas is the competition term without the interactions. Table 20 suggests that competition leads to a 0.9% reduction of DS-1 prices and a 9.9% increase of DS-3 prices in price cap regions. This compares with the estimate of -1.4% for DS-1s in price cap areas from table 14a and a 5.5% increase for DS-3 circuits in price cap areas from table 14b. The signs of the coefficients from the different sources match up, though the magnitudes are of some difference. Examining the effect in Phase I areas when using interactions requires the addition of the competitive effect and the interaction effect for Phase I regions. For DS-1 circuits Table 20 indicates that the presence of a competitor lowers prices by 2.1% (-0.9% + -1.2%).[6] The estimate for DS-3 circuits is -9.0% (= 9.9% + -18.9%).[7] Tables 14a and 14b estimate prices for DS-1s are 1.2% lower with competition in Phase I areas and DS-3 prices are reduced by 2.8% by competition in Phase I areas. However in both of those instances the effects are not

[5] This illustrates the drawback of using separate regressions. We would like to compare the difference of the competition parameters in the price cap area to the phase I area, however because they are separate regressions we cannot do so. It is entirely possible that while individually the coefficients are not statistically different from zero, the difference between them is. Table 20 suggests that this is the case.

[6] It is not possible to conduct a statistical test to determine if this value is significantly different from zero with the information available in the table. It requires information about the covariance between the two estimated parameters. The sum of these two parameters is statistically different from zero even though the two parameters individually are not statistically different from zero.

[7] This sum is not statistically different from zero.

statistically different from zero. Summarizing the Phase I comparison, in this instance the two methods differ both in their findings of statistical significance and the magnitude of the competitive effects

Finally, considering Phase II areas, table 20 estimates that DS-1 prices are 3.0% lower and DS-3 prices are 13.7% lower with competition in Phase II areas. Both of these results are statistically different from zero. Returning to tables 14a and 14b, that DS-1 prices are 4.4% lower in areas with competition and DS-3 prices are 20.9% lower in areas with competition. In addition, both estimates are statistically different from zero. While the magnitudes of DS-3 prices are again different, the pattern is similar.

In summary, whether through the use of interaction terms or separate regressions, it appears that DS-1 and DS-3 prices are consistently lower when facing competition in Phase II areas than when facing competition in price cap and Phase I areas.

Table 1: Summary of the Regression Results

Competition Variable	DS-1			DS-3			High Bandwidth		
	Price Cap	Phase I	Phase II	Price Cap	Phase I	Phase II	Price Cap	Phase I	Phase II
A Facilities-based Competitor is in the Census Block	-, -	(-), (-)	-, -	(+), (+)	(-), (-)	-, -	+, +	(+), (+)	(-), (+)
A Facilities-based Competitor is in the Building	-, -, -	-, -, -	-, -, -	(+),(+),(+)	(-),(-),(-)	-, -, -	+, (+), +	(+),(-),(+)	(-),(-),(-)
At Least One Facilities-based Competitor is in the Block But Not the Building	(-), (-)	-, -	-, -	(-), (-)	(-), (-)	(-), (-)	(+), (+)	(-), (-)	(+), (+)
At Least One Facilities-based Competitor is in the Tract But Not the Block	(-)	-	-	(-)	-	(-)	(-)	(-)	(-)
One Facilities-based Competitor is in the Block But Not the Building	(-)	-	(-)	(-)	(-)	(-)	(+)	(+)	(+)
Two or Three Facilities-based Competitors are in the Block But Not the Building	(-)	(-)	-	(-)	(-)	(-)	(+)	(-)	(+)
Four or More Facilities-based Competitors are in the Block But Not the Building	(-)	(+)	(-)	(+)	(-)	(-)	+	(-)	(+)
An Indep. CLEC Has a Fiber Network in the Census Block	(-)	(+)	(+)	(-)	(-)	(+)	(+)	(-)	(-)

+ and – indicate that the estimated coefficient on the competition variable was positive or negative and statistically different from zero at the 95% level of confidence. If enclosed in parenthesis the coefficient was not statistically different from zero at the 95% level of confidence.

This table does not include results from Tables 16 and 20. Due to the interaction terms in these regression specifications, the sign, and statistical significance, may vary depending on the values of other variables in the regression.

Table 14a: Regression of Log of DS-1 Price on Competition in the Census Block (Table 14 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Census Block	-0.032	-0.025	-0.020	-0.014	-0.012	-0.044
	(0.004)*	(0.004)*	(0.004)*	(0.005)*	(0.006)	(0.008)*
Customer is a Telecommunications Provider	-0.196	-0.196	-0.166	-0.089	-0.259	-0.087
	(0.010)*	(0.010)*	(0.008)*	(0.011)*	(0.014)*	(0.016)*
Customer is a Mobile Telecommunications Provider	0.103	0.103	0.090	0.034	0.138	0.098
	(0.006)*	(0.006)*	(0.005)*	(0.005)*	(0.009)*	(0.010)*
Customer is a Cable Operator	-0.073	-0.073	-0.078	-0.159	-0.053	-0.069
	(0.009)*	(0.009)*	(0.008)*	(0.040)*	(0.010)*	(0.012)*
Natural Log of Establishments in the Zip Code	0.008					
	(0.015)					
Natural Log of Employment in the Zip Code	-0.004					
	(0.030)					
Natural Log of Annual Payroll in the Zip Code	-0.016					
	(0.022)					
Natural Log of Number of Establishments in the Census Block (D&B)	0.011					
	(0.002)*					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006					
	(0.001)*					
Log of Establishments per Square Mile in the Zip Code		0.007	0.026	0.025	0.017	0.019
		(0.015)	(0.015)	(0.014)	(0.030)	(0.023)
Log of Employment per Square Mile in the Zip Code		-0.020	-0.039	-0.055	-0.029	-0.013
		(0.012)	(0.010)*	(0.011)*	(0.019)	(0.018)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		-0.011	0.023	-0.022	0.017	0.064
		(0.021)	(0.025)	(0.021)	(0.043)	(0.034)
Constant	5.513	5.463	5.425	5.752	5.376	5.029
	(0.088)*	(0.082)*	(0.107)*	(0.070)*	(0.220)*	(0.143)*
Adjusted R-Squared	0.33	0.33	0.38	0.44	0.29	0.38
F Statistic	136.35	168.17	177.65	35.83	142.27	47.78
Observations	1,399,440	1,399,165	1,806,659	579,119	679,520	548,020

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 14b: Regression of Log of DS-3 Price on Competition in the Census Block (Table 14 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Census Block	-0.109	-0.112	-0.056	0.055	-0.028	-0.209
	(0.042)*	(0.038)*	(0.034)	(0.044)	(0.063)	(0.056)*
Customer is a Telecommunications Provider	-0.025	-0.025	-0.033	-0.132	-0.034	0.086
	(0.043)	(0.042)	(0.039)	(0.070)	(0.064)	(0.059)
Customer is a Mobile Telecommunications Provider	0.194	0.194	0.198	0.094	0.248	0.223
	(0.050)*	(0.050)*	(0.045)*	(0.051)	(0.058)*	(0.100)*
Customer is a Cable Operator	-0.050	-0.050	-0.063	0.085	-0.116	-0.036
	(0.046)	(0.046)	(0.043)	(0.075)	(0.077)	(0.045)
Natural Log of Establishments in the Zip Code	0.031					
	(0.107)					
Natural Log of Employment in the Zip Code	0.105					
	(0.200)					
Natural Log of Annual Payroll in the Zip Code	-0.052					
	(0.148)					
Natural Log of Number of Establishments in the Census Block (D&B)	-0.024					
	(0.025)					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	0.045					
	(0.019)*					
Log of Establishments per Square Mile in the Zip Code		-0.019	0.077	0.001	0.127	-0.108
		(0.091)	(0.088)	(0.123)	(0.161)	(0.090)
Log of Employment per Square Mile in the Zip Code		0.022	0.058	0.029	0.003	0.156
		(0.079)	(0.072)	(0.091)	(0.147)	(0.078)*
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		0.018	0.213	-0.441	0.557	-0.069
		(0.142)	(0.129)	(0.180)*	(0.196)*	(0.171)
Constant	5.762	6.389	4.870	8.236	3.384	6.171
	(0.728)*	(0.521)*	(0.608)*	(0.710)*	(0.808)*	(0.592)*
Adjusted R-Squared	0.26	0.26	0.28	0.42	0.24	0.27
F Statistic	5.57	5.16	7.18	2.03	5.85	3.88
Observations	120,129	120,109	138,158	27,253	58,790	52,115

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 14c: Regression of Log of High Bandwidth Price on Competition in the Census Block (Table 14 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Census Block	0.023	0.026	0.022	0.082	0.003	-0.002
	(0.030)	(0.028)	(0.023)	(0.037)*	(0.037)	(0.036)
Customer is a Telecommunications Provider	0.135	0.135	0.137	0.193	0.005	0.497
	(0.049)*	(0.049)*	(0.042)*	(0.049)*	(0.056)	(0.090)*
Customer is a Mobile Telecommunications Provider	-0.201	-0.202	-0.212	-0.203	-0.132	-0.324
	(0.104)	(0.103)	(0.083)*	(0.035)*	(0.148)	(0.058)*
Customer is a Cable Operator	-0.464	-0.463	-0.352	-0.099	-0.117	-0.679
	(0.256)	(0.256)	(0.204)	(0.216)	(0.250)	(0.323)*
Natural Log of Establishments in the Zip Code	-0.140					
	(0.070)*					
Natural Log of Employment in the Zip Code	0.041					
	(0.147)					
Natural Log of Annual Payroll in the Zip Code	0.074					
	(0.105)					
Natural Log of Number of Establishments in the Census Block (D&B)	0.005					
	(0.013)					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.003					
	(0.012)					
Natural Log of Mbps	0.247	0.247	0.240	0.102	0.236	0.397
	(0.051)*	(0.051)*	(0.045)*	(0.034)*	(0.074)*	(0.021)*
Packet-based Connection	-0.531	-0.531	-0.620	-1.353	-0.020	-0.217
	(0.090)*	(0.090)*	(0.081)*	(0.119)*	(0.077)	(0.164)
Log of Establishments per Square Mile in the Zip Code		-0.155	-0.098	0.150	-0.297	-0.039
		(0.082)	(0.094)	(0.175)	(0.109)*	(0.150)
Log of Employment per Square Mile in the Zip Code		0.116	0.085	-0.084	0.221	0.032
		(0.070)	(0.084)	(0.157)	(0.097)*	(0.138)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		0.092	-0.018	-0.106	0.007	0.113
		(0.105)	(0.083)	(0.130)	(0.168)	(0.165)
Constant	5.757	5.709	6.128	7.723	5.647	4.680
	(0.511)*	(0.475)*	(0.429)*	(0.699)*	(0.734)*	(0.585)*
Adjusted R-Squared	0.45	0.45	0.52	0.71	0.41	0.48
F Statistic	12.71	15.40	16.68	24.31	11.53	79.21
Observations	80,326	80,318	100,513	30,553	48,499	21,461

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 15a: Regression of Log of DS-1 Price on Competition and Indep. CLEC Network in the Census Block (Table 15 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Census Block	-0.032	-0.025	-0.020	-0.013	-0.012	-0.045
	(0.004)*	(0.004)*	(0.004)*	(0.005)*	(0.007)	(0.008)*
An Indep. CLEC Has a Fiber Network in the Census Block	-0.003	0.004	-0.003	-0.009	0.003	0.009
	(0.004)	(0.004)	(0.004)	(0.006)	(0.006)	(0.010)
Customer is a Telecommunications Provider	-0.196	-0.196	-0.166	-0.089	-0.259	-0.087
	(0.010)*	(0.010)*	(0.008)*	(0.011)*	(0.014)*	(0.016)*
Customer is a Mobile Telecommunications Provider	0.103	0.103	0.090	0.034	0.138	0.098
	(0.006)*	(0.006)*	(0.005)*	(0.005)*	(0.009)*	(0.010)*
Customer is a Cable Operator	-0.073	-0.073	-0.078	-0.159	-0.053	-0.069
	(0.009)*	(0.009)*	(0.008)*	(0.040)*	(0.010)*	(0.012)*
Natural Log of Establishments in the Zip Code	0.008					
	(0.015)					
Natural Log of Employment in the Zip Code	-0.004					
	(0.030)					
Natural Log of Annual Payroll in the Zip Code	-0.016					
	(0.022)					
Natural Log of Number of Establishments in the Census Block (D&B)	0.012					
	(0.002)*					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007					
	(0.002)*					
Log of Establishments per Square Mile in the Zip Code		0.007	0.026	0.025	0.017	0.019
		(0.015)	(0.015)	(0.014)	(0.030)	(0.023)
Log of Employment per Square Mile in the Zip Code		-0.020	-0.039	-0.054	-0.029	-0.013
		(0.012)	(0.010)*	(0.011)*	(0.019)	(0.018)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		-0.011	0.023	-0.022	0.017	0.064
		(0.021)	(0.025)	(0.021)	(0.043)	(0.034)
Constant	5.515	5.460	5.427	5.757	5.374	5.021
	(0.088)*	(0.082)*	(0.106)*	(0.070)*	(0.219)*	(0.143)*
Adjusted R-Squared	0.33	0.33	0.38	0.44	0.29	0.38
F Statistic	122.72	147.20	155.50	31.53	124.50	42.07
Observations	1,399,440	1,399,165	1,806,659	579,119	679,520	548,020

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 15b: Regression of Log of DS-3 Price on Competition and Indep. CLEC Network in the Census Block (Table 15 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Census Block	-0.108	-0.109	-0.050	0.060	-0.017	-0.210
	(0.043)*	(0.038)*	(0.035)	(0.044)	(0.064)	(0.058)*
An Indep. CLEC Has a Fiber Network in the Census Block	-0.016	-0.036	-0.076	-0.054	-0.159	0.006
	(0.047)	(0.046)	(0.037)*	(0.048)	(0.082)	(0.070)
Customer is a Telecommunications Provider	-0.025	-0.025	-0.034	-0.134	-0.034	0.086
	(0.043)	(0.042)	(0.039)	(0.070)	(0.064)	(0.059)
Customer is a Mobile Telecommunications Provider	0.194	0.194	0.199	0.094	0.249	0.223
	(0.050)*	(0.050)*	(0.045)*	(0.051)	(0.058)*	(0.100)*
Customer is a Cable Operator	-0.050	-0.050	-0.063	0.086	-0.116	-0.036
	(0.046)	(0.046)	(0.043)	(0.075)	(0.077)	(0.045)
Natural Log of Establishments in the Zip Code	0.031					
	(0.107)					
Natural Log of Employment in the Zip Code	0.104					
	(0.200)					
Natural Log of Annual Payroll in the Zip Code	-0.051					
	(0.148)					
Natural Log of Number of Establishments in the Census Block (D&B)	-0.023					
	(0.025)					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	0.045					
	(0.019)*					
Log of Establishments per Square Mile in the Zip Code		-0.019	0.077	0.000	0.125	-0.108
		(0.091)	(0.088)	(0.122)	(0.161)	(0.090)
Log of Employment per Square Mile in the Zip Code		0.022	0.058	0.029	0.002	0.156
		(0.079)	(0.072)	(0.091)	(0.147)	(0.078)*
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		0.018	0.214	-0.440	0.562	-0.069
		(0.142)	(0.129)	(0.179)*	(0.196)*	(0.171)
Constant	5.776	6.418	4.936	8.271	3.520	6.165
	(0.731)*	(0.522)*	(0.604)*	(0.710)*	(0.801)*	(0.594)*
Adjusted R-Squared	0.26	0.26	0.28	0.42	0.24	0.27
F Statistic	5.14	4.70	6.83	1.89	5.48	3.43
Observations	120,129	120,109	138,158	27,253	58,790	52,115

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 15c: Regression of Log of High Bandwidth Price on Competition and Indep. CLEC Network in the Census Block (Table 15 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Census Block	0.025	0.029	0.024	0.081	0.005	0.007
	(0.030)	(0.029)	(0.024)	(0.037)*	(0.037)	(0.037)
An Indep. CLEC Has a Fiber Network in the Census Block	-0.030	-0.027	-0.023	0.006	-0.017	-0.082
	(0.030)	(0.029)	(0.025)	(0.031)	(0.058)	(0.044)
Customer is a Telecommunications Provider	0.136	0.135	0.137	0.194	0.005	0.498
	(0.049)*	(0.049)*	(0.042)*	(0.049)*	(0.056)	(0.090)*
Customer is a Mobile Telecommunications Provider	-0.201	-0.201	-0.212	-0.203	-0.132	-0.324
	(0.104)	(0.103)	(0.083)*	(0.035)*	(0.148)	(0.058)*
Customer is a Cable Operator	-0.464	-0.463	-0.351	-0.100	-0.117	-0.673
	(0.256)	(0.256)	(0.204)	(0.216)	(0.250)	(0.324)*
Natural Log of Establishments in the Zip Code	-0.140					
	(0.070)*					
Natural Log of Employment in the Zip Code	0.040					
	(0.147)					
Natural Log of Annual Payroll in the Zip Code	0.075					
	(0.105)					
Natural Log of Number of Establishments in the Census Block (D&B)	0.006					
	(0.013)					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.004					
	(0.012)					
Natural Log of Mbps	0.247	0.247	0.240	0.102	0.236	0.397
	(0.051)*	(0.051)*	(0.045)*	(0.034)*	(0.074)*	(0.021)*
Packet-based Connection	-0.531	-0.531	-0.620	-1.353	-0.020	-0.216
	(0.090)*	(0.090)*	(0.081)*	(0.119)*	(0.077)	(0.164)
Log of Establishments per Square Mile in the Zip Code		-0.155	-0.098	0.150	-0.296	-0.043
		(0.082)	(0.093)	(0.175)	(0.109)*	(0.151)
Log of Employment per Square Mile in the Zip Code		0.115	0.085	-0.084	0.221	0.036
		(0.070)	(0.083)	(0.157)	(0.097)*	(0.139)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		0.093	-0.018	-0.107	0.008	0.106
		(0.105)	(0.083)	(0.130)	(0.168)	(0.167)
Constant	5.785	5.731	6.144	7.722	5.660	4.759
	(0.513)*	(0.477)*	(0.431)*	(0.701)*	(0.736)*	(0.589)*
Adjusted R-Squared	0.45	0.45	0.52	0.71	0.41	0.48
F Statistic	11.74	13.96	15.12	21.89	10.38	71.84
Observations	80,326	80,318	100,513	30,553	48,499	21,461

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 16a: Regression of Log of DS-1 Price on Competition interacted with Indep. CLEC Network in the Census Block (Table 16 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Census Block	-0.017	-0.013	-0.016	-0.022	-0.027	0.011
	(0.010)	(0.010)	(0.008)	(0.011)*	(0.017)	(0.019)
An Indep. CLEC Has a Fiber Network in the Census Block	0.000	0.006	-0.002	-0.011	0.001	0.021
	(0.005)	(0.005)	(0.004)	(0.006)	(0.006)	(0.012)
Ind. CLEC Fiber Network in CB x Facilities-based CLEC in Building in CB	-0.016	-0.014	-0.005	0.012	0.015	-0.061
	(0.011)	(0.011)	(0.009)	(0.012)	(0.018)	(0.020)*
Customer is a Telecommunications Provider	-0.196	-0.196	-0.166	-0.089	-0.259	-0.087
	(0.010)*	(0.010)*	(0.008)*	(0.011)*	(0.014)*	(0.016)*
Customer is a Mobile Telecommunications Provider	0.103	0.103	0.090	0.034	0.138	0.098
	(0.006)*	(0.006)*	(0.005)*	(0.005)*	(0.009)*	(0.010)*
Customer is a Cable Operator	-0.073	-0.073	-0.078	-0.159	-0.053	-0.069
	(0.009)*	(0.009)*	(0.008)*	(0.040)*	(0.010)*	(0.012)*
Natural Log of Establishments in the Zip Code	0.009					
	(0.015)					
Natural Log of Employment in the Zip Code	-0.004					
	(0.030)					
Natural Log of Annual Payroll in the Zip Code	-0.015					
	(0.022)					
Natural Log of Number of Establishments in the Census Block (D&B)	0.012					
	(0.002)*					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007					
	(0.002)*					
Log of Establishments per Square Mile in the Zip Code		0.007	0.026	0.025	0.017	0.020
		(0.015)	(0.015)	(0.014)	(0.030)	(0.023)
Log of Employment per Square Mile in the Zip Code		-0.020	-0.039	-0.054	-0.029	-0.014
		(0.012)	(0.010)*	(0.011)*	(0.019)	(0.018)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		-0.010	0.023	-0.022	0.017	0.066
		(0.021)	(0.025)	(0.021)	(0.043)	(0.034)
Constant	5.513	5.458	5.426	5.758	5.376	5.008
	(0.088)*	(0.082)*	(0.106)*	(0.070)*	(0.218)*	(0.143)*
Adjusted R-Squared	0.33	0.33	0.38	0.44	0.29	0.38
F Statistic	111.67	131.00	138.24	28.15	110.98	38.18
Observations	1,399,440	1,399,165	1,806,659	579,119	679,520	548,020

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 16b: Regression of Log of DS-3 Price on Competition interacted with Indep. CLEC Network in the Census Block (Table 16 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Census Block	0.032	0.028	0.002	0.153	0.024	-0.218
	(0.103)	(0.104)	(0.077)	(0.106)	(0.224)	(0.111)*
An Indep. CLEC Has a Fiber Network in the Census Block	0.035	0.013	-0.059	-0.019	-0.148	0.004
	(0.054)	(0.052)	(0.043)	(0.058)	(0.067)*	(0.090)
Ind. CLEC Fiber Network in CB x Facilities-based CLEC in Building in CB	-0.151	-0.148	-0.057	-0.111	-0.043	0.009
	(0.109)	(0.111)	(0.084)	(0.114)	(0.231)	(0.126)
Customer is a Telecommunications Provider	-0.025	-0.025	-0.034	-0.135	-0.034	0.086
	(0.043)	(0.042)	(0.039)	(0.070)	(0.064)	(0.059)
Customer is a Mobile Telecommunications Provider	0.194	0.194	0.199	0.094	0.249	0.223
	(0.050)*	(0.050)*	(0.045)*	(0.051)	(0.058)*	(0.100)*
Customer is a Cable Operator	-0.050	-0.050	-0.063	0.087	-0.116	-0.036
	(0.046)	(0.046)	(0.043)	(0.075)	(0.077)	(0.045)
Natural Log of Establishments in the Zip Code	0.033					
	(0.108)					
Natural Log of Employment in the Zip Code	0.101					
	(0.200)					
Natural Log of Annual Payroll in the Zip Code	-0.049					
	(0.148)					
Natural Log of Number of Establishments in the Census Block (D&B)	-0.024					
	(0.025)					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	0.045					
	(0.019)*					
Log of Establishments per Square Mile in the Zip Code		-0.017	0.078	0.004	0.126	-0.109
		(0.092)	(0.088)	(0.122)	(0.161)	(0.090)
Log of Employment per Square Mile in the Zip Code		0.021	0.058	0.027	0.002	0.156
		(0.079)	(0.072)	(0.090)	(0.147)	(0.078)*
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		0.019	0.215	-0.448	0.562	-0.069
		(0.142)	(0.129)	(0.179)*	(0.196)*	(0.171)
Constant	5.724	6.370	4.916	8.283	3.507	6.168
	(0.731)*	(0.523)*	(0.603)*	(0.709)*	(0.799)*	(0.598)*
Adjusted R-Squared	0.26	0.26	0.28	0.42	0.24	0.27
F Statistic	4.72	4.21	6.07	1.73	5.04	3.19
Observations	120,129	120,109	138,158	27,253	58,790	52,115

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 16c: Regression of Log of High Bandwidth Price on Competition interacted with Indep. CLEC Network in the Census Block (Table 16 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Census Block	0.040	0.044	0.124	0.112	0.127	0.161
	(0.071)	(0.071)	(0.067)	(0.067)	(0.206)	(0.114)
An Indep. CLEC Has a Fiber Network in the Census Block	-0.028	-0.024	-0.006	0.011	0.009	-0.051
	(0.032)	(0.031)	(0.025)	(0.034)	(0.038)	(0.046)
Ind. CLEC Fiber Network in CB x Facilities-based CLEC in Building in CB	-0.016	-0.016	-0.109	-0.039	-0.126	-0.165
	(0.075)	(0.075)	(0.071)	(0.076)	(0.210)	(0.119)
Customer is a Telecommunications Provider	0.136	0.135	0.137	0.193	0.005	0.497
	(0.049)*	(0.049)*	(0.042)*	(0.049)*	(0.056)	(0.090)*
Customer is a Mobile Telecommunications Provider	-0.201	-0.201	-0.212	-0.203	-0.132	-0.324
	(0.104)	(0.103)	(0.083)*	(0.035)*	(0.148)	(0.058)*
Customer is a Cable Operator	-0.464	-0.463	-0.352	-0.100	-0.117	-0.675
	(0.256)	(0.256)	(0.204)	(0.216)	(0.250)	(0.324)*
Natural Log of Establishments in the Zip Code	-0.140					
	(0.070)*					
Natural Log of Employment in the Zip Code	0.041					
	(0.147)					
Natural Log of Annual Payroll in the Zip Code	0.074					
	(0.105)					
Natural Log of Number of Establishments in the Census Block (D&B)	0.006					
	(0.013)					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.003					
	(0.012)					
Natural Log of Mbps	0.247	0.247	0.240	0.102	0.236	0.397
	(0.051)*	(0.051)*	(0.045)*	(0.034)*	(0.074)*	(0.021)*
Packet-based Connection	-0.531	-0.531	-0.620	-1.354	-0.019	-0.215
	(0.090)*	(0.090)*	(0.081)*	(0.119)*	(0.077)	(0.164)
Log of Establishments per Square Mile in the Zip Code		-0.155	-0.099	0.150	-0.296	-0.047
		(0.082)	(0.093)	(0.175)	(0.109)*	(0.150)
Log of Employment per Square Mile in the Zip Code		0.115	0.085	-0.084	0.221	0.039
		(0.070)	(0.084)	(0.157)	(0.097)*	(0.138)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		0.093	-0.018	-0.107	0.008	0.103
		(0.105)	(0.083)	(0.130)	(0.168)	(0.166)
Constant	5.783	5.729	6.132	7.722	5.634	4.745
	(0.513)*	(0.478)*	(0.430)*	(0.701)*	(0.734)*	(0.589)*
Adjusted R-Squared	0.45	0.45	0.52	0.71	0.41	0.48
F Statistic	10.84	12.71	14.19	19.95	9.45	65.68
Observations	80,326	80,318	100,513	30,553	48,499	21,461

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 17a: Regression of Log of DS-1 Price on Competition in the Building and the Block (Table 17 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Building	-0.047	-0.045	-0.039	-0.027	-0.032	-0.059
	(0.006)*	(0.006)*	(0.006)*	(0.009)*	(0.009)*	(0.013)*
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.027	-0.018	-0.017	-0.009	-0.017	-0.025
	(0.006)*	(0.006)*	(0.005)*	(0.005)	(0.009)*	(0.010)*
Customer is a Telecommunications Provider	-0.197	-0.197	-0.167	-0.089	-0.260	-0.087
	(0.010)*	(0.010)*	(0.008)*	(0.011)*	(0.014)*	(0.016)*
Customer is a Mobile Telecommunications Provider	0.104	0.103	0.090	0.034	0.138	0.098
	(0.006)*	(0.006)*	(0.005)*	(0.005)*	(0.009)*	(0.010)*
Customer is a Cable Operator	-0.073	-0.073	-0.078	-0.158	-0.054	-0.069
	(0.009)*	(0.009)*	(0.008)*	(0.040)*	(0.010)*	(0.012)*
Natural Log of Establishments in the Zip Code	0.009					
	(0.014)					
Natural Log of Employment in the Zip Code	-0.008					
	(0.029)					
Natural Log of Annual Payroll in the Zip Code	-0.012					
	(0.021)					
Natural Log of Number of Establishments in the Census Block (D&B)	0.012					
	(0.002)*					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006					
	(0.002)*					
Log of Establishments per Square Mile in the Zip Code		0.008	0.027	0.025	0.019	0.020
		(0.015)	(0.015)	(0.014)	(0.030)	(0.023)
Log of Employment per Square Mile in the Zip Code		-0.020	-0.039	-0.054	-0.030	-0.013
		(0.012)	(0.010)*	(0.011)*	(0.019)	(0.018)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		-0.007	0.026	-0.022	0.021	0.066
		(0.021)	(0.025)	(0.021)	(0.043)	(0.034)
Constant	5.500	5.455	5.419	5.751	5.364	5.021
	(0.087)*	(0.081)*	(0.108)*	(0.070)*	(0.223)*	(0.141)*
Adjusted R-Squared	0.33	0.33	0.38	0.44	0.29	0.38
F Statistic	125.17	152.88	164.02	31.85	137.72	43.45
Observations	1,399,440	1,399,165	1,806,659	579,119	679,520	548,020

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 17b: Regression of Log of DS-3 Price on Competition in the Building and the Block (Table 17 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Building	-0.063	-0.056	-0.034	0.109	-0.035	-0.138
	(0.047)	(0.047)	(0.044)	(0.075)	(0.080)	(0.058)*
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.118	-0.118	-0.083	-0.028	-0.112	-0.081
	(0.060)*	(0.061)	(0.054)	(0.067)	(0.098)	(0.075)
Customer is a Telecommunications Provider	-0.026	-0.026	-0.034	-0.132	-0.038	0.088
	(0.043)	(0.042)	(0.039)	(0.070)	(0.064)	(0.059)
Customer is a Mobile Telecommunications Provider	0.195	0.194	0.198	0.095	0.247	0.225
	(0.050)*	(0.050)*	(0.045)*	(0.051)	(0.059)*	(0.100)*
Customer is a Cable Operator	-0.049	-0.049	-0.062	0.088	-0.115	-0.035
	(0.046)	(0.046)	(0.043)	(0.074)	(0.077)	(0.045)
Natural Log of Establishments in the Zip Code	0.037					
	(0.108)					
Natural Log of Employment in the Zip Code	0.067					
	(0.205)					
Natural Log of Annual Payroll in the Zip Code	-0.020					
	(0.152)					
Natural Log of Number of Establishments in the Census Block (D&B)	-0.016					
	(0.022)					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	0.044					
	(0.019)*					
Log of Establishments per Square Mile in the Zip Code		-0.011	0.085	0.000	0.148	-0.110
		(0.092)	(0.088)	(0.122)	(0.161)	(0.090)
Log of Employment per Square Mile in the Zip Code		0.016	0.056	0.029	-0.001	0.148
		(0.080)	(0.073)	(0.091)	(0.148)	(0.078)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		0.046	0.234	-0.442	0.587	-0.047
		(0.148)	(0.131)	(0.180)*	(0.199)*	(0.175)
Constant	5.654	6.292	4.787	8.249	3.241	6.112
	(0.732)*	(0.535)*	(0.621)*	(0.710)*	(0.843)*	(0.620)*
Adjusted R-Squared	0.26	0.26	0.28	0.42	0.25	0.27
F Statistic	4.50	3.75	5.62	1.90	4.96	2.30
Observations	120,129	120,109	138,158	27,253	58,790	52,115

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 17c: Regression of Log of High Bandwidth Price on Competition in the Building and the Block (Table 17 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Building	-0.023	-0.022	-0.005	0.117	0.003	-0.055
	(0.038)	(0.037)	(0.034)	(0.056)*	(0.043)	(0.042)
At Least One Facilities-based Competitor is in the Block But Not the Building	0.053	0.054	0.041	0.055	-0.006	0.049
	(0.034)	(0.032)	(0.028)	(0.039)	(0.032)	(0.041)
Customer is a Telecommunications Provider	0.135	0.136	0.137	0.193	0.005	0.497
	(0.049)*	(0.049)*	(0.042)*	(0.049)*	(0.056)	(0.090)*
Customer is a Mobile Telecommunications Provider	-0.201	-0.202	-0.212	-0.202	-0.132	-0.325
	(0.103)	(0.103)	(0.083)*	(0.035)*	(0.148)	(0.058)*
Customer is a Cable Operator	-0.462	-0.462	-0.352	-0.105	-0.117	-0.679
	(0.256)	(0.256)	(0.204)	(0.216)	(0.250)	(0.324)*
Natural Log of Establishments in the Zip Code	-0.143					
	(0.070)*					
Natural Log of Employment in the Zip Code	0.054					
	(0.146)					
Natural Log of Annual Payroll in the Zip Code	0.064					
	(0.104)					
Natural Log of Number of Establishments in the Census Block (D&B)	-0.000					
	(0.013)					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	0.000					
	(0.012)					
Natural Log of Mbps	0.247	0.247	0.240	0.101	0.236	0.398
	(0.051)*	(0.051)*	(0.045)*	(0.034)*	(0.074)*	(0.021)*
Packet-based Connection	-0.530	-0.530	-0.620	-1.353	-0.020	-0.219
	(0.088)*	(0.089)*	(0.081)*	(0.119)*	(0.077)	(0.164)
Log of Establishments per Square Mile in the Zip Code		-0.156	-0.099	0.149	-0.296	-0.032
		(0.082)	(0.093)	(0.175)	(0.108)*	(0.149)
Log of Employment per Square Mile in the Zip Code		0.118	0.085	-0.084	0.221	0.029
		(0.071)	(0.084)	(0.157)	(0.097)*	(0.137)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		0.081	-0.022	-0.107	0.009	0.108
		(0.104)	(0.083)	(0.131)	(0.168)	(0.166)
Constant	5.785	5.742	6.139	7.722	5.643	4.689
	(0.513)*	(0.478)*	(0.430)*	(0.699)*	(0.736)*	(0.595)*
Adjusted R-Squared	0.45	0.45	0.52	0.71	0.41	0.48
F Statistic	11.87	14.28	15.94	22.17	10.20	71.70
Observations	80,326	80,318	100,513	30,553	48,499	21,461

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 18a: Regression of Log of DS-1 Price on Competition in the Building, the Block, and the Tract (Table 18 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Building	-0.051	-0.049	-0.043	-0.029	-0.036	-0.064
	(0.007)*	(0.007)*	(0.007)*	(0.010)*	(0.009)*	(0.013)*
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.033	-0.025	-0.023	-0.011	-0.024	-0.032
	(0.007)*	(0.007)*	(0.006)*	(0.007)	(0.010)*	(0.011)*
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.030	-0.032	-0.028	-0.005	-0.035	-0.038
	(0.007)*	(0.007)*	(0.007)*	(0.009)	(0.011)*	(0.015)*
Customer is a Telecommunications Provider	-0.197	-0.197	-0.167	-0.089	-0.260	-0.087
	(0.010)*	(0.010)*	(0.008)*	(0.011)*	(0.014)*	(0.016)*
Customer is a Mobile Telecommunications Provider	0.103	0.103	0.090	0.034	0.138	0.098
	(0.006)*	(0.006)*	(0.005)*	(0.005)*	(0.009)*	(0.010)*
Customer is a Cable Operator	-0.073	-0.073	-0.078	-0.158	-0.054	-0.069
	(0.009)*	(0.009)*	(0.008)*	(0.040)*	(0.010)*	(0.011)*
Natural Log of Establishments in the Zip Code	0.008					
	(0.014)					
Natural Log of Employment in the Zip Code	-0.009					
	(0.029)					
Natural Log of Annual Payroll in the Zip Code	-0.011					
	(0.021)					
Natural Log of Number of Establishments in the Census Block (D&B)	0.012					
	(0.002)*					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006					
	(0.002)*					
Log of Establishments per Square Mile in the Zip Code		0.008	0.027	0.025	0.020	0.020
		(0.015)	(0.015)	(0.014)	(0.030)	(0.023)
Log of Employment per Square Mile in the Zip Code		-0.020	-0.039	-0.054	-0.030	-0.014
		(0.012)	(0.010)*	(0.011)*	(0.019)	(0.018)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		-0.006	0.026	-0.022	0.022	0.068
		(0.021)	(0.025)	(0.021)	(0.044)	(0.034)*
Constant	5.525	5.481	5.440	5.756	5.392	5.051
	(0.087)*	(0.081)*	(0.110)*	(0.070)*	(0.227)*	(0.142)*
Adjusted R-Squared	0.33	0.33	0.38	0.44	0.29	0.38
F Statistic	113.86	136.14	146.02	28.32	122.74	39.12
Observations	1,399,440	1,399,165	1,806,659	579,119	679,520	548,020

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 18b: Regression of Log of DS-3 Price on Competition in the Building, the Block, and the Tract (Table 18 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Building	-0.074	-0.067	-0.046	0.098	-0.045	-0.150
	(0.048)	(0.048)	(0.045)	(0.075)	(0.081)	(0.059)*
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.136	-0.136	-0.101	-0.047	-0.127	-0.098
	(0.062)*	(0.063)*	(0.056)	(0.072)	(0.100)	(0.079)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.210	-0.198	-0.187	-0.092	-0.273	-0.174
	(0.074)*	(0.074)*	(0.063)*	(0.069)	(0.125)*	(0.117)
Customer is a Telecommunications Provider	-0.025	-0.025	-0.034	-0.128	-0.040	0.088
	(0.043)	(0.043)	(0.039)	(0.071)	(0.064)	(0.059)
Customer is a Mobile Telecommunications Provider	0.194	0.193	0.198	0.095	0.246	0.224
	(0.050)*	(0.050)*	(0.045)*	(0.051)	(0.059)*	(0.100)*
Customer is a Cable Operator	-0.049	-0.048	-0.061	0.088	-0.114	-0.033
	(0.046)	(0.046)	(0.043)	(0.074)	(0.077)	(0.046)
Natural Log of Establishments in the Zip Code	0.039					
	(0.109)					
Natural Log of Employment in the Zip Code	0.068					
	(0.206)					
Natural Log of Annual Payroll in the Zip Code	-0.023					
	(0.153)					
Natural Log of Number of Establishments in the Census Block (D&B)	-0.020					
	(0.022)					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	0.047					
	(0.019)*					
Log of Establishments per Square Mile in the Zip Code		-0.005	0.090	0.003	0.151	-0.107
		(0.093)	(0.088)	(0.122)	(0.161)	(0.090)
Log of Employment per Square Mile in the Zip Code		0.015	0.056	0.028	0.004	0.146
		(0.081)	(0.073)	(0.091)	(0.149)	(0.078)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		0.040	0.233	-0.445	0.569	-0.041
		(0.148)	(0.132)	(0.180)*	(0.200)*	(0.175)
Constant	5.860	6.485	4.943	8.336	3.516	6.251
	(0.737)*	(0.543)*	(0.633)*	(0.714)*	(0.859)*	(0.633)*
Adjusted R-Squared	0.26	0.26	0.28	0.42	0.25	0.27
F Statistic	4.42	3.74	5.70	1.91	4.73	2.20
Observations	120,129	120,109	138,158	27,253	58,790	52,115

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 18c: Regression of Log of High Bandwidth Price on Competition in the Building, the Block, and the Tract (Table 18 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Building	-0.026	-0.025	-0.010	0.114	-0.002	-0.058
	(0.038)	(0.038)	(0.034)	(0.059)	(0.044)	(0.043)
At Least One Facilities-based Competitor is in the Block But Not the Building	0.049	0.049	0.034	0.052	-0.013	0.044
	(0.035)	(0.034)	(0.030)	(0.044)	(0.034)	(0.044)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.039	-0.040	-0.046	-0.013	-0.078	-0.039
	(0.042)	(0.042)	(0.037)	(0.068)	(0.053)	(0.051)
Customer is a Telecommunications Provider	0.135	0.136	0.137	0.193	0.005	0.496
	(0.049)*	(0.049)*	(0.042)*	(0.049)*	(0.056)	(0.090)*
Customer is a Mobile Telecommunications Provider	-0.201	-0.202	-0.212	-0.202	-0.132	-0.325
	(0.103)	(0.103)	(0.083)*	(0.035)*	(0.148)	(0.058)*
Customer is a Cable Operator	-0.462	-0.462	-0.352	-0.105	-0.117	-0.679
	(0.256)	(0.256)	(0.204)	(0.216)	(0.250)	(0.324)*
Natural Log of Establishments in the Zip Code	-0.143					
	(0.070)*					
Natural Log of Employment in the Zip Code	0.053					
	(0.146)					
Natural Log of Annual Payroll in the Zip Code	0.065					
	(0.104)					
Natural Log of Number of Establishments in the Census Block (D&B)	-0.001					
	(0.013)					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	0.000					
	(0.012)					
Natural Log of Mbps	0.247	0.247	0.240	0.101	0.236	0.398
	(0.051)*	(0.051)*	(0.045)*	(0.034)*	(0.074)*	(0.021)*
Packet-based Connection	-0.530	-0.530	-0.620	-1.352	-0.020	-0.219
	(0.089)*	(0.089)*	(0.081)*	(0.119)*	(0.077)	(0.164)
Log of Establishments per Square Mile in the Zip Code		-0.156	-0.098	0.149	-0.296	-0.033
		(0.082)	(0.093)	(0.175)	(0.108)*	(0.148)
Log of Employment per Square Mile in the Zip Code		0.118	0.085	-0.084	0.221	0.029
		(0.071)	(0.084)	(0.157)	(0.097)*	(0.136)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		0.082	-0.020	-0.107	0.012	0.109
		(0.104)	(0.083)	(0.131)	(0.169)	(0.165)
Constant	5.815	5.774	6.174	7.733	5.702	4.720
	(0.513)*	(0.479)*	(0.430)*	(0.697)*	(0.742)*	(0.594)*
Adjusted R-Squared	0.45	0.45	0.52	0.71	0.41	0.48
F Statistic	11.38	13.45	15.16	20.21	9.78	66.32
Observations	80,326	80,318	100,513	30,553	48,499	21,461

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 19a: Regression of Log of DS-1 Price on Number of Competitors in the Census Block (Table 19 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Building	-0.048	-0.045	-0.039	-0.027	-0.031	-0.061
	(0.006)*	(0.006)*	(0.006)*	(0.009)*	(0.009)*	(0.013)*
One Facilities-based Competitor is in the Block But Not the Building	-0.018	-0.010	-0.010	-0.010	-0.022	0.000
	(0.005)*	(0.005)*	(0.005)*	(0.006)	(0.007)*	(0.009)
Two or Three Facilities-based Competitors are in the Block But Not the Building	-0.051	-0.039	-0.034	-0.002	-0.016	-0.073
	(0.010)*	(0.009)*	(0.009)*	(0.012)	(0.013)	(0.018)*
Four or More Facilities-based Competitors are in the Block But Not the Building	-0.040	-0.023	-0.020	-0.053	0.007	-0.061
	(0.025)	(0.024)	(0.023)	(0.027)	(0.034)	(0.033)
Customer is a Telecommunications Provider	-0.197	-0.197	-0.167	-0.089	-0.259	-0.087
	(0.010)*	(0.010)*	(0.008)*	(0.011)*	(0.014)*	(0.016)*
Customer is a Mobile Telecommunications Provider	0.103	0.103	0.090	0.034	0.138	0.097
	(0.006)*	(0.006)*	(0.005)*	(0.005)*	(0.009)*	(0.010)*
Customer is a Cable Operator	-0.073	-0.073	-0.078	-0.158	-0.053	-0.070
	(0.009)*	(0.009)*	(0.008)*	(0.040)*	(0.010)*	(0.012)*
Natural Log of Establishments in the Zip Code	0.008					
	(0.014)					
Natural Log of Employment in the Zip Code	-0.011					
	(0.030)					
Natural Log of Annual Payroll in the Zip Code	-0.008					
	(0.022)					
Natural Log of Number of Establishments in the Census Block (D&B)	0.013					
	(0.002)*					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006					
	(0.002)*					
Log of Establishments per Square Mile in the Zip Code		0.008	0.027	0.025	0.020	0.019
		(0.015)	(0.015)	(0.014)	(0.030)	(0.023)
Log of Employment per Square Mile in the Zip Code		-0.020	-0.039	-0.054	-0.031	-0.014
		(0.012)	(0.010)*	(0.011)*	(0.019)	(0.018)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		-0.004	0.028	-0.022	0.020	0.076
		(0.021)	(0.025)	(0.021)	(0.043)	(0.033)*
Constant	5.486	5.443	5.411	5.752	5.371	4.991
	(0.087)*	(0.081)*	(0.108)*	(0.070)*	(0.221)*	(0.138)*
Adjusted R-Squared	0.33	0.33	0.38	0.44	0.29	0.38
F Statistic	105.24	123.47	131.75	25.98	111.54	36.80
Observations	1,399,440	1,399,165	1,806,659	579,119	679,520	548,020

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 19b: Regression of Log of DS-3 Price on Number of Competitors in the Census Block (Table 19 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Building	-0.066	-0.060	-0.035	0.106	-0.025	-0.152
	(0.046)	(0.046)	(0.043)	(0.072)	(0.080)	(0.057)*
One Facilities-based Competitor is in the Block But Not the Building	-0.095	-0.092	-0.064	-0.020	-0.102	-0.046
	(0.070)	(0.071)	(0.063)	(0.054)	(0.128)	(0.075)
Two or Three Facilities-based Competitors are in the Block But Not the Building	-0.154	-0.154	-0.112	-0.087	-0.157	-0.080
	(0.070)*	(0.070)*	(0.064)	(0.133)	(0.099)	(0.105)
Four or More Facilities-based Competitors are in the Block But Not the Building	-0.132	-0.136	-0.085	0.351	-0.048	-0.249
	(0.092)	(0.092)	(0.089)	(0.307)	(0.124)	(0.147)
Customer is a Telecommunications Provider	-0.025	-0.025	-0.034	-0.133	-0.034	0.087
	(0.043)	(0.043)	(0.039)	(0.071)	(0.064)	(0.059)
Customer is a Mobile Telecommunications Provider	0.195	0.194	0.198	0.098	0.250	0.227
	(0.050)*	(0.050)*	(0.045)*	(0.051)	(0.058)*	(0.100)*
Customer is a Cable Operator	-0.049	-0.049	-0.062	0.092	-0.113	-0.034
	(0.046)	(0.046)	(0.043)	(0.074)	(0.076)	(0.045)
Natural Log of Establishments in the Zip Code	0.038					
	(0.110)					
Natural Log of Employment in the Zip Code	0.057					
	(0.208)					
Natural Log of Annual Payroll in the Zip Code	-0.011					
	(0.155)					
Natural Log of Number of Establishments in the Census Block (D&B)	-0.014					
	(0.022)					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	0.043					
	(0.019)*					
Log of Establishments per Square Mile in the Zip Code		-0.009	0.087	0.004	0.157	-0.107
		(0.094)	(0.089)	(0.122)	(0.160)	(0.091)
Log of Employment per Square Mile in the Zip Code		0.016	0.056	0.021	-0.005	0.134
		(0.081)	(0.073)	(0.092)	(0.148)	(0.078)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		0.053	0.238	-0.441	0.586	-0.035
		(0.150)	(0.132)	(0.181)*	(0.200)*	(0.179)
Constant	5.623	6.263	4.758	8.277	3.225	6.173
	(0.741)*	(0.542)*	(0.626)*	(0.710)*	(0.853)*	(0.669)*
Adjusted R-Squared	0.26	0.26	0.28	0.42	0.25	0.27
F Statistic	4.06	3.39	4.92	1.74	4.56	1.99
Observations	120,129	120,109	138,158	27,253	58,790	52,115

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 19c: Regression of Log of High Bandwidth Price on Number of Competitors in the Census Block (Similar to Table 19 in Rysman Paper)

	Rysman Paper	D&B Areas	All Areas	Price Cap Areas	Phase I Areas	Phase II Areas
A Facilities-based Competitor is in the Building	-0.024	-0.023	-0.006	0.123	0.002	-0.054
	(0.038)	(0.038)	(0.034)	(0.055)*	(0.043)	(0.042)
One Facilities-based Competitor is in the Block But Not the Building	0.045	0.045	0.038	0.030	0.007	0.069
	(0.029)	(0.028)	(0.025)	(0.039)	(0.031)	(0.044)
Two or Three Facilities-based Competitors are in the Block But Not the Building	0.074	0.074	0.052	0.145	-0.006	0.022
	(0.052)	(0.049)	(0.046)	(0.094)	(0.046)	(0.063)
Four or More Facilities-based Competitors are in the Block But Not the Building	0.040	0.040	0.023	0.321	-0.037	0.011
	(0.063)	(0.060)	(0.057)	(0.159)*	(0.063)	(0.100)
Customer is a Telecommunications Provider	0.136	0.136	0.137	0.196	0.005	0.497
	(0.049)*	(0.049)*	(0.042)*	(0.049)*	(0.057)	(0.090)*
Customer is a Mobile Telecommunications Provider	-0.201	-0.202	-0.212	-0.202	-0.132	-0.326
	(0.104)	(0.104)	(0.083)*	(0.035)*	(0.148)	(0.057)*
Customer is a Cable Operator	-0.463	-0.462	-0.353	-0.107	-0.120	-0.683
	(0.256)	(0.256)	(0.204)	(0.212)	(0.251)	(0.324)*
Natural Log of Establishments in the Zip Code	-0.143					
	(0.069)*					
Natural Log of Employment in the Zip Code	0.058					
	(0.146)					
Natural Log of Annual Payroll in the Zip Code	0.061					
	(0.105)					
Natural Log of Number of Establishments in the Census Block (D&B)	-0.001					
	(0.013)					
Natural Log of Establishments (D&B) per Square Mile in the Census Block	0.000					
	(0.012)					
Natural Log of Mbps	0.247	0.247	0.240	0.100	0.237	0.398
	(0.051)*	(0.051)*	(0.045)*	(0.034)*	(0.074)*	(0.021)*
Packet-based Connection	-0.529	-0.529	-0.619	-1.346	-0.020	-0.218
	(0.088)*	(0.088)*	(0.080)*	(0.119)*	(0.077)	(0.164)
Log of Establishments per Square Mile in the Zip Code		-0.157	-0.099	0.148	-0.297	-0.032
		(0.082)	(0.094)	(0.175)	(0.108)*	(0.151)
Log of Employment per Square Mile in the Zip Code		0.119	0.086	-0.084	0.223	0.027
		(0.071)	(0.084)	(0.157)	(0.097)*	(0.138)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		0.078	-0.022	-0.106	0.012	0.108
		(0.104)	(0.084)	(0.130)	(0.168)	(0.167)
Constant	5.785	5.747	6.135	7.711	5.620	4.705
	(0.520)*	(0.485)*	(0.435)*	(0.699)*	(0.746)*	(0.570)*
Adjusted R-Squared	0.45	0.45	0.52	0.71	0.41	0.48
F Statistic	10.32	12.07	13.43	19.92	8.73	60.29
Observations	80,326	80,318	100,513	30,553	48,499	21,461

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

Table 20: Regression of Log Price on Competition in the Block, by Price Flex Regulation (Table 20 in Rysman Paper)

	DS-1 Rysman Paper	DS-1 D&B Areas	DS-1 All Areas	DS-3 Rysman Paper	DS-3 D&B Areas	DS-3 All Areas
A Facilities-based Competitor is in the Census Block	0.001	0.008	-0.009	0.125	0.119	0.099
	(0.008)	(0.008)	(0.006)	(0.059)*	(0.057)*	(0.044)*
Phase 1 x Facilities-based Competitor in Census Block	-0.038	-0.037	-0.012	-0.337	-0.337	-0.189
	(0.010)*	(0.010)*	(0.009)	(0.081)*	(0.081)*	(0.077)*
Phase 2 x Facilities-based Competitor in Census Block	-0.048	-0.047	-0.021	-0.265	-0.259	-0.236
	(0.013)*	(0.013)*	(0.011)	(0.084)*	(0.084)*	(0.073)*
Customer is a Telecommunications Provider	-0.196	-0.196	-0.166	-0.024	-0.023	-0.033
	(0.010)*	(0.010)*	(0.008)*	(0.042)	(0.042)	(0.039)
Customer is a Mobile Telecommunications Provider	0.103	0.103	0.090	0.195	0.194	0.198
	(0.006)*	(0.006)*	(0.005)*	(0.050)*	(0.050)*	(0.045)*
Customer is a Cable Operator	-0.073	-0.073	-0.078	-0.051	-0.051	-0.064
	(0.009)*	(0.009)*	(0.008)*	(0.046)	(0.046)	(0.043)
Natural Log of Establishments in the Zip Code	0.009			0.038		
	(0.015)			(0.108)		
Natural Log of Employment in the Zip Code	-0.005			0.082		
	(0.030)			(0.201)		
Natural Log of Annual Payroll in the Zip Code	-0.015			-0.038		
	(0.022)			(0.148)		
Natural Log of Number of Establishments in the Census Block (D&B)	0.012			-0.025		
	(0.002)*			(0.025)		
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006			0.046		
	(0.001)*			(0.019)*		
Log of Establishments per Square Mile in the Zip Code		0.007	0.026		-0.006	0.084
		(0.015)	(0.015)		(0.092)	(0.088)
Log of Employment per Square Mile in the Zip Code		-0.020	-0.039		0.014	0.057
		(0.012)	(0.010)*		(0.080)	(0.073)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code		-0.010	0.023		0.024	0.222
		(0.021)	(0.025)		(0.142)	(0.128)
Constant	5.511	5.461	5.424	5.772	6.386	4.833
	(0.088)*	(0.081)*	(0.106)*	(0.728)*	(0.521)*	(0.602)*
Adjusted R-Squared	0.33	0.33	0.38	0.26	0.26	0.28
F Statistic	112.41	131.99	139.74	6.12	6.02	7.49
Observations	1,399,440	1,399,165	1,806,659	120,129	120,109	138,158

* $p<0.05$

Standard errors in parentheses allow for correlated error terms within a census block

Census Tract Fixed Effects

ATTACHMENT 3

Competitive Effect of Cable Network Infrastructure

Federal Communications Commission Staff[1]

June 28, 2016

(revised July 8, 2016)

Competition in the provision of business data services (BDS) uses many technologies. Cable operators are increasing their capacity to provide BDS over hybrid fiber-coax cable (HFC) infrastructure. We examine whether, in 2013, these deployments and the resulting potential to compete in BDS markets had an influence on ILEC prices. Regression analysis is used to measure this effect. If this cable infrastructure was having an influence on the ability to exercise market power, we would expect to observe that for products and areas where there is evidence of incumbent local exchange company (ILEC) market power (a statistically significant negative effect of facilities-based competition variables on ILEC prices) that the presence of the cable infrastructure has a statistically negative effect on prices. In those locations, the effect of facilities-based competition would be attenuated if there were a positive correlation between cable infrastructure and competitive entry (though the cumulative effect might still be larger than when only facilities-based competition is used in the regressions, as would be the case if cable and facilities-based competition were not perfectly correlated, and if facilities-based competition was not always sufficient to drive price down to competitive levels). We would also observe competitive effects from cable where it is present but facilities-based competition is not.

Two comparisons are made to address the question of whether in 2013 cable presence placed competitive pressures on BDS prices. We first modify the regression specifications of Professor Marc Rysman's White Paper, "Empirics of Business Data Services" (Rysman Paper) to capture competition from cable as measured by a report that a provider had deployed HFC network infrastructure. We find that inclusion of the cable infrastructure has no appreciable effect on the previously estimated effects of facilities-based competition. In addition, we find that the presence of the potential cable competition generally does not have a statistically significant effect on its own. Second, we also estimate the effect of potential cable competition using three regression specifications for each of the three types of price cap regulations (pure price cap, Phase I, and Phase II) for each of the three types of connections. With these alternative specifications, we also find that potential cable competition has relatively minor effects on ILEC prices and generally did not appear to be a significant source of competition in 2013. In addition, potential cable competition does not significantly change the estimated effect of actual facilities-based competition, including the presence of fiber networks, on ILEC prices.

Cable operators typically use the DOCSIS 3.0 protocol over their HFC network infrastructure to provide bidirectional broadband services to business and residential locations at variable bandwidth speeds and quality controls.[2] In addition, certain cable companies have upgraded their headends to provide Metro Ethernet-capabilities both over their fiber and HFC network connections that are linked to

[1] We acknowledge and appreciate Tracy Waldon, FCC Economist, for his contributions to this paper.

[2] We understand that BDS offerings are not practicable on earlier versions of DOCSIS.

such headends. According to Comcast, Metro Ethernet-enabled headends are a precondition to the provision of Ethernet services to locations, i.e., BDS.[3] From the National Broadband Map (NBM), we obtained a list of census blocks where the DOCSIS 3.0 (or higher) technology protocol was deployed in December 2013 by each reporting cable provider.[4] For purposes of this analysis, we assume the cable provider's DOCSIS 3.0 (or higher) coverage is coterminous with the extent of a cable company's HFC network coverage. Separately, Comcast, Charter, Cox, and Time Warner have provided the FCC with information to allow us to identify census blocks served by HFC network infrastructure linked by Metro Ethernet-enabled headends in 2013.[5] Using this information, we construct three different measures to indicate whether HFC-delivered services, including BDS, could have potentially been available in a census block: 1) DOCSIS 3.0 deployment, 2) an expansive definition of Metro Ethernet deployment, and 3) a narrow definition of Metro Ethernet deployment.

The first measure, DOCSIS 3.0 deployment, is the most expansive and yields a list of 5,110,078 census blocks where DOCSIS 3.0 has been deployed. This is the most liberal measure of potential BDS competition over HFC network infrastructure that we use. To further refine the areas where HFC-delivered services may be closer substitutes to traditional BDS, we develop two measures, which indicate census blocks that are served by Metro Ethernet-enabled headends, a narrower and expansive measure. The narrow definition of Metro Ethernet deployment assumes that all cable operators other than Comcast, Charter, Time Warner, and Cox have not deployed Metro Ethernet. The expansive definition of Metro Ethernet deployment assumes with limited exception that the census blocks served by HFC network linked to Metro Ethernet-enabled headends are the same as the census blocks with DOCSIS 3.0 (or higher) coverage according to the NBM data for 2013. Of the 658,486 census blocks with a location in the dataset, 79% have DOCSIS 3.0 HFC available, 64% have Metro Ethernet available using the expansive definition, and 51% have Metro Ethernet available using the narrow definition.[6]

Using these three definitions of BDS-comparable HFC infrastructure, we examine whether potential cable competition constrained ILEC prices. We begin by examining the influence of the measure of potential cable competition by including each of the three measures of competition individually in the regressions from the Rysman Paper. In the Rysman Paper, these tables are numbered 14 through 20 and we retain the convention here. We present the original regression results table followed by three tables presenting the regression results from the exact same specification but that include the DOCSIS measure (sub-table a), the expansive Metro Ethernet variable (sub-table b), and the

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[3] *See* Letter from Matthew Brill, Counsel to Comcast, to Marlene H. Dortch, Secretary, FCC, WC Docket No. 05-25, at 1 (filed Mar. 25, 2016) ("Ethernet services delivered over Comcast's HFC network require access to the HFC network as well as service from an Ethernet-capable headend.").

[4] NBM/ State Broadband Initiative (December 2013, accessible at http://www2.ntia.doc.gov/broadband-data).

[5] *See* Letter from Matthew Brill, Counsel to Comcast Corp. (Comcast), to Marlene H. Dortch, Secretary, FCC, WC Docket No. 05-25 (filed June 1, 2016); Letter from Samuel Feder, Counsel to Charter Communications, Inc. (Charter), to Marlene H. Dortch, Secretary, FCC, WC Docket No. 05-25 (filed May 27, 2016); Letter from Michael Pryor, Counsel to Cox Communications, Inc. (Cox), to Marlene H. Dortch, Secretary, FCC, WC Docket No. 05-25 (filed May 18, 2016); Letter from Matthew Brill, Counsel to Time Warner Cable (Time Warner), to Marlene H. Dortch, Secretary, FCC, WC Docket No. 05-25 (filed May 12, 2016).

[6] Of the 1.7 million geocoded locations in the data, 83% are located in census blocks with DOCSIS 3.0, 71% are located in census blocks with the expansive definition of Metro Ethernet, and 60% are located in census blocks with the limited definition of Metro Ethernet.

limited Metro Ethernet variable (sub-table c). To evaluate the impact of these variables, we look at two things: 1) what is the change in the estimated parameters of the facilities-based competition variables from the original Rysman Paper when including the potential cable competition measures, and 2) what are the effects of the potential cable competition measures on prices.

For Tables 14 through 20 the inclusion of the HFC variables has no substantial effect on the parameters of the facilities-based competition variables used in the Rysman Paper. There are no changes in statistical significance and the changes in the values of the parameters are quite small. For Table 15 there is a relatively small reduction in the competitive impact of a fiber network. Otherwise, differences are not noticeable. The effect of the measures of cable competition are not statistically significant for DS-1 and DS-3 circuits when estimated using census tract fixed effects. However, when using county fixed effects, they are on occasion statistically significant. When they are statistically significant, they are uniformly negative, as expected from variables measuring competition. However, the fact that they are not statistically significant when using tract fixed effects leads me to conclude that these measures are correlated with characteristics that are not varying at the tract level, but do vary at the county level, rather than being an actual competitive effect. It is unlikely that this potential competition would work over the larger area of a county, yet be invisible at the smaller distances involved in a census tract.

Table 20 presents more interesting changes that require careful interpretation due to the inclusion of interaction effects between the regulatory status and competition variables. A regression of this form allows for the estimation of different competitive effects under the three forms of price cap regulation. The regressions for DS-1 circuits using tract fixed effects in Tables 20 through 20c estimate the effect on ILEC prices of facilities-based competition in the census block in pure price cap areas ranges to be between 0.1% and -0.7%, though these estimates are not significantly different from zero.[7] The estimates of the difference between the effects of facilities-based competition in pure price cap areas and Phase I areas ranges from -3.8% when potential cable competition is not included (Table 20) to -2.6% when potential competition from Metro Ethernet is included. The effect of a facilities-based competitor in Phase I areas, calculated by summing the stand-alone competition variable with the competition and Phase I interaction term ranges from -3.3% to -3.7%, all of which are significantly different from zero at the 95% level of confidence.[8] Similarly, the estimates of the effect of facilities-based competition in Phase II areas for DS-1 circuits are unaffected by the inclusion of potential cable competition, The estimated effect of facilities-based competition ranges from -4.6% to -4.8% in Phase II areas. Clearly the presence of potential cable competition does not meaningfully attenuate the effect of facilities-based competition on ILEC DS-1 prices.

Potential cable competition may also have a competitive effect on DS-1 prices, though that effect varies widely depending on how potential cable competition is defined. When potential cable competition is defined as the presence of DOCSIS 3.0 (Table 20a) the effect is not statistically different

[7] We retain the convention of interpreting the coefficients as percent changes. However as discussed in the Rysman Paper at footnote 36 (in the April 2016 version), this calculation is only an approximation. A more appropriate approximation would be exp(-0.007)-1 = -0.00698 or a 0.698% decrease in ILEC prices. As can be seen, this finer approximation has little effect when the parameter estimates are close to zero. The approximations can diverge more substantially for parameters that are farther from zero.

[8] We do not report the relevant test statistics for this and similar significance tests.

from zero in pure price cap areas. When the definition is based on the presence of Metro Ethernet infrastructure, the effect in pure price cap areas ranges from 3.7% to 6.7% and is statistically different from zero. In Phase I areas the effect of potential cable competition exhibits a bit more stability ranging from -2.9% to -4.3% and is statistically significant. The estimates of the effect of potential cable competition on ILEC DS-1 prices in Phase II areas are not statistically different from zero.

Turning to the DS-3 regressions using census tract fixed effects, the estimates of the effect of facilities-based competition in pure price cap regions are influenced by the inclusion of potential cable competition. When potential cable competition is not accounted for, it is estimated that the presence of a facilities-based competitor in a census block increases prices by a statistically significant 12.6% in pure price cap areas. A similar effect occurs when potential cable competition is measured using the narrow definition for Metro Ethernet deployment. However, the expansive Metro Ethernet measure and the DOCSIS measure substantially reduce this effect on DS-3 prices and hypothesis testing indicates that the effect is not statistically different from zero. There is also some attenuation of the effect of facilities-based competition in Phase I areas (summing the standalone competition and the competition and Phase I interaction terms). The effect ranges from -11.2% to -18.4% when accounting for potential cable competition as compared to an effect of -21.1% when potential cable competition is not included. In Phase II areas similar changes exist, though they are in the opposite direction. Inclusion of potential cable competition appears to enhance the competitive effects of facilities-based competition. When potential cable competition is not accounted for, facilities-based competition changes DS-3 prices by -13.9%, compared to effects of -17.0% to -19.5% when potential cable competition is included.

In these census tract fixed effect regressions, the estimates of the effect of potential cable competition on DS-3 prices vary widely. In price cap areas they vary from 7.0% to 16.2%, though at no point are these estimates statistically significant. In Phase I areas, the estimates range from -11.3% to an astounding -53.2%, while in Phase II areas the effect is of the opposite sign and the range is a narrower 20.6% to 27.6%.[9] In both areas, the effects vary between being statistically significant and insignificant. For the DS-3 regressions, the effects of potential cable competition appear unreliable due to the wide variation that exists in the estimated effects (in contrast to the estimates for DS-1 circuits as well as the estimates in previous tables).

Overall, for both DS-1 and DS-3 circuits, the effect of facilities-based competition is reasonably stable to the inclusion of potential cable competition. When potential cable competition is influencing these estimates, the estimates remain large and in some instances become even larger. The effect of potential cable competition on prices are relatively small, but stable, for DS-1 circuits, particularly compared to the estimates for DS-3 circuits. In summary, Tables 20 through 20c lead us to conclude that while potential cable competition may have some impact on ILEC prices (strengthening the conclusion that where competition is present it can reduce prices, implying the presence of greater market power where competition is not present than suggested by the Rysman Paper's original regressions), facilities-based competition is providing the most significant and reliable effect to limit market power where it exists.

[9] Using the finer approximation discussed previously, these effects are -10.8%, -41.3%, -18.6%, and -24.1%.

Interpreting Tables 20 through 20c illustrate the difficulties of working with multiple interaction terms to sort out differences in competitive effects under different forms of price regulation. We therefore follow previous methods and run separate regressions for each of the pricing regulations: pure price cap, Phase I, and Phase II. Tables 1.1a through 3.3c use this framework to estimate the effect of potential cable competition for each of the three types of connections (DS-1, DS-3, high bandwidth[10]) for three regression models and the three measures of HFC competition. Tables 1.1a through 1.1c examine the influence on DS-1 prices for regression model 1 in the three regulatory areas. Tables 2.1a through 2.1c and Tables 3.1a through 3.1c similarly examine DS-3 and high bandwidth connections, respectively. Regression model 2 is examined in Tables 1.2a – 1.2c, 2.2a-2.2c, and 3.2a-3.2c for DS-1, DS-3, and high bandwidth connections and regression model 3 is in Tables 1.3a – 1.3c, 2.3a-2.3c, and 3.3a-3.3c.

Examining Table 1.1a illustrates the effect of potential cable competition for DS-1 circuits in pure price cap areas using regression model 1, which closely corresponds to Table 14 in the Rysman Paper. The first column estimates the effect of facilities-based competition in the block without accounting for potential cable competition, while the remaining three columns estimate the effect while accounting for potential cable competition using the three measures: DOCSIS, the expansive Metro Ethernet definition, and the limited Metro Ethernet definition. The first clear result from Table 1.1a is that inclusion of potential cable competition does not materially impact the estimated effect of facilities-based competition. The parameters on the variable labeled "A Facilities-based Competitor is in the Census Block" are virtually unchanged across the four regression specifications. Further, the effect of potential cable competition based on the presence of DOCSIS and the two measures of Metro Ethernet deployment does not have a statistically significant effect on ILEC DS-1 prices in pure price cap areas. Turning to the effect in Phase I areas using Table 1.1b, neither facilities-based competition nor potential cable competition has an effect on prices. As with pure price cap areas, the inclusion of potential cable competition does not change the estimated effect of facilities-based competition. Table 1.1c estimates the effect in Phase II areas and the pattern is similar; no change in the estimates effect of facilities-based competition and potential cable competition does not have a statistically significant effect.

Looking at the same regression model but with respect to DS-3 circuits (Tables 2.1a-2.1c) we do see some differences arising, which should not be surprising given what was seen in Tables 20 through 20c. In pure price cap areas the estimate of the effect of facilities-based competitors ranges from 5.0% to 5.6% depending on which measure of potential cable competition is used. While there is some movement, the differences do not change the overall conclusions because the estimated effects are not statistically significant. In Phase I areas, we find no statistically significant effect from facilities-based competition or from potential cable competition using Metro Ethernet. However, when DOCSIS 3.0 is available in the census block it appears that prices are 42.2% lower. This result is anomalous when taken as a whole and likely represents another factor that is correlated with DOCSIS deployment in Phase I areas rather than the deployment itself. For example, it is possible that DOCSIS deployment tends to follow demand until household density falls below a certain level at which point it is no longer economically feasible to upgrade the cable infrastructure. This might be matched by price for BDS services, that is, BDS prices may noticeably jump, perhaps due to cost characteristics, but maybe also due to market power or the existence of density pricing zones, when population density falls enough. In Phase II areas, we find a strong and consistent effect (-20.9% to -21.6%) for facilities-based competition

[10] High bandwidth connections are defined as those connections with a bandwidth greater than 45 Mbps

and positive and statistically insignificant effects for potential cable competition. However, even if the result is taken at face value, that is that it suggests DOCSIS deployment lowers BDS prices on top of any lowering due to fiber competition, this strengthens rather than undermines the earlier analysis. In particular, it indicates prices are even higher, absent competition, than the earlier analysis suggested

As evidenced by the Rysman Paper, high bandwidth connections tend to show little difference between the different regulatory areas. The parameters on the effect of facilities-based competition are relatively stable to the inclusion of potential cable competition across all three pricing areas. The Metro Ethernet indicators are statistically significant and negative as expected. However, because the facilities-based competition variable is statistically significant and positive, this result is questionable. It is difficult to believe that potential cable competition, with its limited bandwidth, has an effect on high bandwidth prices, yet facilities-based competitors with actual connections in the census block lead to higher prices. Because it is highly unlikely that potential competition from low bandwidth BDS is constraining prices for high bandwidth BDS while actual facilities-based competition is increasing them, we conclude that this effect is picking up another factor that influences prices, such as costs.

We estimate two more regression models to further examine how competition may be evidenced. In regression model 2 (Tables 1.2a-1.2c, 2.2a-2.2c, and 3.2a-3.2c), we include the presence of independent CLEC fiber as was done in Rysman Paper, Table 15. Regression model 3 is similar to Rysman Paper, Table 18, which examines the effect of competition at the building, block, and tract. The results for DS-1 circuits using regression models 2 and 3 are the same as those found with regression model 1. Inclusion of potential cable competition has no influence on the estimated effect of facilities-based competition in any of the three pricing areas. Potential cable competition is never statistically significant in price cap areas. These regression models also yield similar results for DS-3 circuits as those from regression model 1. Some variation in the estimated facilities-based competition parameters is introduced, mostly in Phase I areas. However, with the exception of the DOCSIS measure in pure price cap and Phase I areas, which run counter to each other, there is no statistical evidence that potential cable competition is influencing ILEC prices. There is little evidence that ILEC prices of high bandwidth connections are influenced by facilities-based competition in the two additional regression models. At no point is there any evidence that facilities-based competition in the census block has a constraining influence on high bandwidth prices. The only instance of a statistically significant effect of potential cable competition is from Metro Ethernet-enabled headends in price cap areas. However, it is difficult to believe that when actual facilities-based competition does not have a constraining effect that we would see potential competition having an effect.

This analysis demonstrates that, at least in 2013, potential cable competition from BDS-comparable HFC infrastructure did not constrain ILEC prices in areas where there was evidence that facilities-based competition was doing so. Overall, we conclude that inclusion of potential cable competition is not necessary to properly model these markets at this time. As cable competition grows it may become an important component but in 2013, it was not.

Table 14: Regression of Log Price on Competition in the Census Block (Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.032	-0.109	0.023	-0.056	-0.114	0.046
	(0.004)*	(0.042)*	(0.030)	(0.007)*	(0.035)*	(0.038)
Customer is a Telecommunications Provider	-0.196	-0.025	0.135	-0.131	0.014	0.145
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.201	0.148	0.199	-0.364
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.041)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.464	-0.055	-0.006	-0.472
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.008	0.030	-0.141	-0.023	0.070	-0.010
	(0.015)	(0.108)	(0.070)*	(0.010)*	(0.057)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.052	0.073	-0.082	0.113	0.123
	(0.022)	(0.148)	(0.105)	(0.014)*	(0.074)	(0.053)*
Natural Log of Employment in the Zip Code	-0.004	0.106	0.043	0.045	-0.182	-0.111
	(0.030)	(0.200)	(0.147)	(0.019)*	(0.106)	(0.069)
Natural Log of Number of Establishments in the Census Block (D&B)	0.011	-0.024	0.005	0.021	0.062	0.028
	(0.002)*	(0.025)	(0.013)	(0.004)*	(0.019)*	(0.014)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.045	-0.003	-0.030	-0.060	-0.042
	(0.001)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.532			-0.660
			(0.090)*			(0.088)*
Constant	5.518	5.763	5.765	6.203	6.468	6.293
	(0.089)*	(0.749)*	(0.516)*	(0.061)*	(0.310)*	(0.266)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	136.35	5.53	12.71	183.62	4.95	14.53
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 14a: Regression of Log Price on Competition in the Census Block with DOCSIS 3.0 Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.032	-0.108	0.024	-0.056	-0.117	0.046
	(0.004)*	(0.042)*	(0.029)	(0.007)*	(0.035)*	(0.038)
DOCSIS 3.0 Available in the Census Block	-0.018	-0.189	-0.110	-0.047	-0.204	0.013
	(0.009)	(0.137)	(0.052)*	(0.014)*	(0.081)*	(0.061)
Customer is a Telecommunications Provider	-0.196	-0.026	0.135	-0.131	0.013	0.145
	(0.010)*	(0.042)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.195	-0.201	0.149	0.201	-0.363
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.041)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.464	-0.054	0.000	-0.472
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.009	0.026	-0.144	-0.019	0.079	-0.011
	(0.015)	(0.109)	(0.071)*	(0.010)	(0.057)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.064	0.065	-0.085	0.094	0.124
	(0.022)	(0.148)	(0.104)	(0.014)*	(0.071)	(0.054)*
Natural Log of Employment in the Zip Code	-0.004	0.119	0.052	0.047	-0.169	-0.111
	(0.030)	(0.200)	(0.146)	(0.018)*	(0.104)	(0.069)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.013	0.009	0.022	0.068	0.027
	(0.002)*	(0.022)	(0.013)	(0.004)*	(0.019)*	(0.014)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.043	-0.002	-0.029	-0.057	-0.042
	(0.001)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.532			-0.661
			(0.090)*			(0.088)*
Constant	5.533	5.984	5.882	6.245	6.700	6.279
	(0.090)*	(0.752)*	(0.520)*	(0.056)*	(0.293)*	(0.277)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	122.67	5.03	12.25	165.26	4.84	13.44
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 14b: Regression of Log Price on Competition in the Census Block with Expansive Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.032	-0.108	0.025	-0.056	-0.115	0.050
	(0.004)*	(0.042)*	(0.029)	(0.007)*	(0.035)*	(0.039)
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)	-0.011	-0.086	-0.107	-0.051	-0.070	-0.078
	(0.007)	(0.116)	(0.032)*	(0.010)*	(0.062)	(0.059)
Customer is a Telecommunications Provider	-0.196	-0.026	0.136	-0.131	0.012	0.144
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.055)*
Customer is a Mobile Telecommunications Provider	0.103	0.195	-0.201	0.148	0.198	-0.367
	(0.006)*	(0.050)*	(0.104)	(0.008)*	(0.041)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.461	-0.054	-0.005	-0.473
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.009	0.033	-0.132	-0.019	0.076	-0.008
	(0.015)	(0.109)	(0.072)	(0.010)	(0.056)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.017	-0.058	0.073	-0.086	0.106	0.119
	(0.022)	(0.148)	(0.105)	(0.014)*	(0.073)	(0.053)*
Natural Log of Employment in the Zip Code	-0.003	0.110	0.036	0.048	-0.177	-0.109
	(0.030)	(0.199)	(0.147)	(0.018)*	(0.106)	(0.068)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.018	0.011	0.023	0.066	0.032
	(0.002)*	(0.023)	(0.013)	(0.004)*	(0.019)*	(0.014)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.043	-0.004	-0.029	-0.059	-0.042
	(0.001)*	(0.020)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.035)*
Packet-based Connection			-0.531			-0.658
			(0.090)*			(0.088)*
Constant	5.527	5.860	5.830	6.241	6.533	6.350
	(0.089)*	(0.750)*	(0.516)*	(0.057)*	(0.312)*	(0.261)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	122.79	4.98	13.17	165.97	4.76	13.25
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 14c: Regression of Log Price on Competition in the Census Block with Narrow Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.032	-0.109	0.025	-0.056	-0.113	0.049
	(0.004)*	(0.042)*	(0.029)	(0.007)*	(0.035)*	(0.039)
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)	-0.008	0.039	-0.103	-0.042	-0.034	-0.052
	(0.007)	(0.065)	(0.031)*	(0.010)*	(0.057)	(0.059)
Customer is a Telecommunications Provider	-0.196	-0.025	0.136	-0.131	0.013	0.144
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.201	0.148	0.199	-0.366
	(0.006)*	(0.050)*	(0.104)	(0.008)*	(0.041)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.461	-0.054	-0.005	-0.473
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.009	0.028	-0.131	-0.020	0.073	-0.009
	(0.015)	(0.107)	(0.072)	(0.010)*	(0.056)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.051	0.074	-0.085	0.111	0.120
	(0.022)	(0.148)	(0.105)	(0.014)*	(0.073)	(0.053)*
Natural Log of Employment in the Zip Code	-0.004	0.106	0.036	0.047	-0.181	-0.109
	(0.030)	(0.199)	(0.147)	(0.018)*	(0.106)	(0.068)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.026	0.011	0.023	0.064	0.030
	(0.002)*	(0.026)	(0.013)	(0.004)*	(0.019)*	(0.014)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.047	-0.005	-0.030	-0.060	-0.042
	(0.001)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.532			-0.659
			(0.090)*			(0.088)*
Constant	5.523	5.730	5.809	6.233	6.504	6.327
	(0.089)*	(0.752)*	(0.515)*	(0.057)*	(0.311)*	(0.262)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	122.72	5.07	13.36	165.56	4.70	13.27
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 15: Regression of Log Price on Competition and CLEC Network in the Census Block (Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.032	-0.108	0.025	-0.052	-0.104	0.054
	(0.004)*	(0.043)*	(0.030)	(0.007)*	(0.035)*	(0.039)
An Indep. CLEC Has a Fiber Network in the Census Block	-0.003	-0.014	-0.030	-0.046	-0.121	-0.073
	(0.004)	(0.048)	(0.030)	(0.007)*	(0.054)*	(0.047)
Customer is a Telecommunications Provider	-0.196	-0.025	0.136	-0.131	0.012	0.146
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.201	0.148	0.196	-0.364
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.464	-0.055	-0.006	-0.467
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.008	0.030	-0.141	-0.022	0.075	-0.010
	(0.015)	(0.108)	(0.070)*	(0.010)*	(0.059)	(0.043)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.052	0.074	-0.081	0.124	0.124
	(0.022)	(0.148)	(0.105)	(0.014)*	(0.074)	(0.053)*
Natural Log of Employment in the Zip Code	-0.004	0.105	0.042	0.045	-0.196	-0.111
	(0.030)	(0.200)	(0.147)	(0.019)*	(0.109)	(0.068)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.024	0.006	0.022	0.064	0.029
	(0.002)*	(0.025)	(0.013)	(0.004)*	(0.019)*	(0.014)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.045	-0.003	-0.030	-0.059	-0.043
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.532			-0.660
			(0.090)*			(0.088)*
Constant	5.520	5.775	5.792	6.223	6.536	6.337
	(0.089)*	(0.753)*	(0.518)*	(0.061)*	(0.315)*	(0.265)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	122.71	5.10	11.74	167.33	5.00	13.41
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 15a: Regression of Log Price on Competition and CLEC Network in the Census Block with DOCSIS 3.0 Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.032	-0.108	0.026	-0.052	-0.109	0.054
	(0.004)*	(0.042)*	(0.030)	(0.007)*	(0.035)*	(0.039)
An Indep. CLEC Has a Fiber Network in the Census Block	-0.002	-0.002	-0.026	-0.043	-0.100	-0.074
	(0.004)	(0.049)	(0.030)	(0.007)*	(0.056)	(0.046)
DOCSIS 3.0 Available in the Census Block	-0.017	-0.189	-0.109	-0.042	-0.195	0.018
	(0.009)	(0.137)	(0.052)*	(0.014)*	(0.081)*	(0.060)
Customer is a Telecommunications Provider	-0.196	-0.026	0.135	-0.131	0.011	0.146
	(0.010)*	(0.042)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.195	-0.201	0.148	0.199	-0.363
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.464	-0.054	-0.001	-0.468
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.009	0.026	-0.144	-0.019	0.083	-0.011
	(0.015)	(0.109)	(0.071)*	(0.010)	(0.059)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.064	0.066	-0.084	0.103	0.126
	(0.022)	(0.148)	(0.104)	(0.014)*	(0.071)	(0.054)*
Natural Log of Employment in the Zip Code	-0.004	0.118	0.051	0.046	-0.182	-0.112
	(0.030)	(0.200)	(0.146)	(0.019)*	(0.107)	(0.069)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.013	0.010	0.023	0.069	0.029
	(0.002)*	(0.022)	(0.013)	(0.004)*	(0.019)*	(0.014)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.043	-0.002	-0.029	-0.056	-0.043
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.531			-0.660
			(0.090)*			(0.088)*
Constant	5.534	5.986	5.905	6.259	6.747	6.319
	(0.089)*	(0.752)*	(0.521)*	(0.057)*	(0.303)*	(0.277)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	111.52	4.68	11.39	152.01	4.67	12.56
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 15b: Regression of Log Price on Competition and CLEC Network in the Census Block with Expansive Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.032	-0.108	0.027	-0.052	-0.105	0.057
	(0.004)*	(0.042)*	(0.030)	(0.007)*	(0.034)*	(0.040)
An Indep. CLEC Has a Fiber Network in the Census Block	-0.002	-0.008	-0.026	-0.042	-0.114	-0.065
	(0.004)	(0.049)	(0.030)	(0.007)*	(0.054)*	(0.044)
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)	-0.011	-0.086	-0.107	-0.048	-0.063	-0.076
	(0.007)	(0.116)	(0.032)*	(0.010)*	(0.063)	(0.059)
Customer is a Telecommunications Provider	-0.196	-0.026	0.136	-0.132	0.011	0.144
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.195	-0.201	0.147	0.196	-0.367
	(0.006)*	(0.050)*	(0.104)	(0.008)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.461	-0.054	-0.005	-0.469
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.009	0.032	-0.132	-0.018	0.080	-0.008
	(0.015)	(0.109)	(0.072)	(0.010)	(0.058)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.017	-0.058	0.074	-0.085	0.116	0.120
	(0.022)	(0.148)	(0.105)	(0.014)*	(0.074)	(0.053)*
Natural Log of Employment in the Zip Code	-0.004	0.109	0.036	0.047	-0.192	-0.109
	(0.030)	(0.199)	(0.147)	(0.019)*	(0.109)	(0.067)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.018	0.012	0.024	0.067	0.033
	(0.002)*	(0.023)	(0.013)	(0.004)*	(0.019)*	(0.015)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.042	-0.005	-0.029	-0.059	-0.042
	(0.001)*	(0.020)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.035)*
Packet-based Connection			-0.531			-0.657
			(0.090)*			(0.088)*
Constant	5.528	5.867	5.853	6.258	6.592	6.388
	(0.089)*	(0.752)*	(0.518)*	(0.058)*	(0.318)*	(0.262)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	111.63	4.64	12.24	153.00	4.68	12.29
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 15c: Regression of Log Price on Competition and CLEC Network in the Census Block with Narrow Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.032	-0.108	0.027	-0.052	-0.104	0.056
	(0.004)*	(0.043)*	(0.030)	(0.007)*	(0.035)*	(0.040)
An Indep. CLEC Has a Fiber Network in the Census Block	-0.002	-0.017	-0.026	-0.043	-0.117	-0.067
	(0.004)	(0.048)	(0.030)	(0.007)*	(0.054)*	(0.044)
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)	-0.008	0.040	-0.102	-0.039	-0.026	-0.048
	(0.007)	(0.065)	(0.031)*	(0.010)*	(0.057)	(0.058)
Customer is a Telecommunications Provider	-0.196	-0.025	0.136	-0.131	0.011	0.145
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.201	0.147	0.196	-0.365
	(0.006)*	(0.050)*	(0.104)	(0.008)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.461	-0.054	-0.006	-0.468
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.009	0.028	-0.131	-0.019	0.077	-0.008
	(0.015)	(0.107)	(0.072)	(0.010)	(0.058)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.051	0.074	-0.084	0.121	0.121
	(0.022)	(0.148)	(0.105)	(0.014)*	(0.074)	(0.053)*
Natural Log of Employment in the Zip Code	-0.004	0.106	0.036	0.046	-0.196	-0.109
	(0.030)	(0.199)	(0.147)	(0.019)*	(0.109)	(0.068)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.026	0.011	0.024	0.065	0.032
	(0.002)*	(0.026)	(0.013)	(0.004)*	(0.019)*	(0.015)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.046	-0.005	-0.030	-0.059	-0.043
	(0.001)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.035)*
Packet-based Connection			-0.532			-0.658
			(0.090)*			(0.088)*
Constant	5.525	5.744	5.832	6.249	6.561	6.366
	(0.089)*	(0.755)*	(0.517)*	(0.058)*	(0.316)*	(0.263)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	111.57	4.72	12.41	152.33	4.64	12.34
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 16: Regression of Log Price on Competition interacted with the Presence of Fiber in the Block (Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.017	0.030	0.040	-0.016	-0.024	0.085
	(0.010)	(0.104)	(0.071)	(0.016)	(0.109)	(0.102)
An Indep. CLEC Has a Fiber Network in the Census Block	0.000	0.035	-0.028	-0.038	-0.090	-0.066
	(0.005)	(0.054)	(0.032)	(0.008)*	(0.067)	(0.051)
Ind. CLEC Fiber Network in CB x Facilities-based CLEC in Building in CB	-0.016	-0.148	-0.016	-0.040	-0.087	-0.033
	(0.011)	(0.110)	(0.075)	(0.017)*	(0.115)	(0.108)
Customer is a Telecommunications Provider	-0.196	-0.025	0.135	-0.131	0.011	0.146
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.201	0.147	0.194	-0.364
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.464	-0.055	-0.007	-0.467
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.009	0.032	-0.141	-0.022	0.078	-0.010
	(0.015)	(0.108)	(0.070)*	(0.010)*	(0.059)	(0.043)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.049	0.074	-0.079	0.128	0.125
	(0.022)	(0.148)	(0.105)	(0.014)*	(0.075)	(0.053)*
Natural Log of Employment in the Zip Code	-0.004	0.102	0.042	0.043	-0.204	-0.112
	(0.030)	(0.200)	(0.147)	(0.019)*	(0.110)	(0.068)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.024	0.006	0.022	0.064	0.029
	(0.002)*	(0.025)	(0.013)	(0.004)*	(0.019)*	(0.014)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.045	-0.003	-0.030	-0.059	-0.042
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.532			-0.659
			(0.090)*			(0.088)*
Constant	5.518	5.726	5.790	6.215	6.510	6.330
	(0.089)*	(0.753)*	(0.519)*	(0.061)*	(0.318)*	(0.265)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	111.67	4.68	10.84	152.46	4.51	12.41
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 16a: Regression of Log Price on Competition interacted with the Presence of Fiber in the Block with DOCSIS 3.0 Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.017	0.045	0.042	-0.015	-0.005	0.084
	(0.010)	(0.104)	(0.071)	(0.016)	(0.112)	(0.102)
An Indep. CLEC Has a Fiber Network in the Census Block	0.001	0.052	-0.023	-0.034	-0.060	-0.067
	(0.005)	(0.057)	(0.032)	(0.008)*	(0.073)	(0.050)
Ind. CLEC Fiber Network in CB x Facilities-based CLEC in Building in CB	-0.016	-0.164	-0.017	-0.041	-0.113	-0.032
	(0.011)	(0.109)	(0.075)	(0.017)*	(0.117)	(0.108)
DOCSIS 3.0 Available in the Census Block	-0.018	-0.191	-0.109	-0.042	-0.198	0.018
	(0.009)	(0.137)	(0.052)*	(0.014)*	(0.081)*	(0.060)
Customer is a Telecommunications Provider	-0.196	-0.027	0.135	-0.131	0.010	0.146
	(0.010)*	(0.042)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.195	-0.201	0.148	0.196	-0.364
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.464	-0.054	-0.001	-0.468
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.009	0.027	-0.144	-0.018	0.086	-0.011
	(0.015)	(0.109)	(0.071)*	(0.010)	(0.059)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.061	0.066	-0.083	0.108	0.126
	(0.022)	(0.148)	(0.104)	(0.014)*	(0.072)	(0.054)*
Natural Log of Employment in the Zip Code	-0.004	0.115	0.051	0.044	-0.192	-0.112
	(0.030)	(0.200)	(0.146)	(0.018)*	(0.108)	(0.068)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.013	0.010	0.023	0.069	0.029
	(0.002)*	(0.022)	(0.013)	(0.004)*	(0.019)*	(0.015)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.043	-0.002	-0.029	-0.056	-0.043
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.531			-0.659
			(0.090)*			(0.088)*
Constant	5.532	5.933	5.903	6.251	6.716	6.313
	(0.089)*	(0.752)*	(0.522)*	(0.057)*	(0.308)*	(0.277)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	102.33	4.34	10.59	139.66	4.32	11.72
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 16b: Regression of Log Price on Competition interacted with the Presence of Fiber in the Block with Expansive Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.017	0.032	0.041	-0.014	-0.022	0.091
	(0.010)	(0.104)	(0.070)	(0.016)	(0.109)	(0.102)
An Indep. CLEC Has a Fiber Network in the Census Block	0.001	0.042	-0.024	-0.033	-0.081	-0.058
	(0.005)	(0.055)	(0.032)	(0.008)*	(0.068)	(0.048)
Ind. CLEC Fiber Network in CB x Facilities-based CLEC in Building in CB	-0.016	-0.151	-0.015	-0.041	-0.091	-0.037
	(0.011)	(0.109)	(0.075)	(0.017)*	(0.114)	(0.107)
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)	-0.011	-0.087	-0.107	-0.049	-0.064	-0.076
	(0.007)	(0.116)	(0.032)*	(0.010)*	(0.062)	(0.059)
Customer is a Telecommunications Provider	-0.196	-0.026	0.136	-0.132	0.010	0.144
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.195	-0.201	0.147	0.194	-0.367
	(0.006)*	(0.050)*	(0.104)	(0.008)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.461	-0.054	-0.006	-0.469
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.009	0.034	-0.132	-0.018	0.082	-0.008
	(0.015)	(0.109)	(0.072)	(0.010)	(0.058)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.017	-0.055	0.074	-0.084	0.121	0.121
	(0.022)	(0.148)	(0.104)	(0.014)*	(0.074)	(0.053)*
Natural Log of Employment in the Zip Code	-0.004	0.106	0.036	0.045	-0.199	-0.110
	(0.030)	(0.200)	(0.147)	(0.018)*	(0.110)	(0.067)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.018	0.012	0.024	0.067	0.033
	(0.002)*	(0.023)	(0.013)	(0.004)*	(0.019)*	(0.015)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.042	-0.005	-0.029	-0.059	-0.042
	(0.001)*	(0.020)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.035)*
Packet-based Connection			-0.531			-0.656
			(0.090)*			(0.088)*
Constant	5.526	5.817	5.851	6.250	6.565	6.381
	(0.089)*	(0.752)*	(0.518)*	(0.058)*	(0.321)*	(0.263)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	102.43	4.30	11.38	140.58	4.30	11.45
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 16c: Regression of Log Price on Competition interacted with the Presence of Fiber in the Block with Narrow Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Census Block	-0.017	0.030	0.040	-0.015	-0.025	0.087
	(0.010)	(0.104)	(0.070)	(0.016)	(0.109)	(0.102)
An Indep. CLEC Has a Fiber Network in the Census Block	0.001	0.033	-0.023	-0.034	-0.086	-0.060
	(0.005)	(0.054)	(0.032)	(0.008)*	(0.067)	(0.048)
Ind. CLEC Fiber Network in CB x Facilities-based CLEC in Building in CB	-0.016	-0.148	-0.013	-0.040	-0.086	-0.033
	(0.011)	(0.110)	(0.075)	(0.017)*	(0.114)	(0.108)
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)	-0.008	0.040	-0.102	-0.039	-0.025	-0.048
	(0.007)	(0.065)	(0.031)*	(0.010)*	(0.057)	(0.058)
Customer is a Telecommunications Provider	-0.196	-0.025	0.136	-0.132	0.011	0.145
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.201	0.147	0.194	-0.366
	(0.006)*	(0.050)*	(0.104)	(0.008)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.050	-0.461	-0.054	-0.007	-0.469
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.174)*
Natural Log of Establishments in the Zip Code	0.009	0.030	-0.131	-0.019	0.079	-0.008
	(0.015)	(0.108)	(0.072)	(0.010)	(0.058)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.048	0.074	-0.083	0.126	0.122
	(0.022)	(0.148)	(0.105)	(0.014)*	(0.075)	(0.053)*
Natural Log of Employment in the Zip Code	-0.004	0.102	0.036	0.044	-0.203	-0.110
	(0.030)	(0.199)	(0.147)	(0.019)*	(0.110)	(0.067)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.026	0.011	0.024	0.065	0.032
	(0.002)*	(0.026)	(0.013)	(0.004)*	(0.019)*	(0.015)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.046	-0.005	-0.030	-0.059	-0.042
	(0.001)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.035)*
Packet-based Connection			-0.532			-0.657
			(0.090)*			(0.088)*
Constant	5.523	5.695	5.830	6.241	6.535	6.359
	(0.089)*	(0.755)*	(0.518)*	(0.058)*	(0.320)*	(0.263)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	102.37	4.36	11.54	139.94	4.25	11.50
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 17: Regression of Log Price on Competition in the Building and the Block (Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Building	-0.047	-0.063	-0.023	-0.066	-0.047	-0.014
	(0.006)*	(0.047)	(0.038)	(0.011)*	(0.038)	(0.039)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.027	-0.118	0.054	-0.044	-0.124	0.062
	(0.006)*	(0.060)*	(0.034)	(0.009)*	(0.045)*	(0.032)*
Customer is a Telecommunications Provider	-0.197	-0.026	0.135	-0.132	0.012	0.147
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.057)*
Customer is a Mobile Telecommunications Provider	0.104	0.195	-0.202	0.149	0.198	-0.363
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.049	-0.462	-0.055	-0.005	-0.466
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.175)*
Natural Log of Establishments in the Zip Code	0.009	0.037	-0.145	-0.023	0.066	-0.007
	(0.015)	(0.109)	(0.070)*	(0.010)*	(0.056)	(0.043)
Natural Log of Annual Payroll in the Zip Code	-0.012	-0.021	0.063	-0.073	0.121	0.124
	(0.021)	(0.153)	(0.105)	(0.014)*	(0.073)	(0.054)*
Natural Log of Employment in the Zip Code	-0.008	0.068	0.056	0.037	-0.186	-0.114
	(0.029)	(0.205)	(0.146)	(0.018)*	(0.105)	(0.068)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.016	-0.000	0.021	0.071	0.022
	(0.002)*	(0.022)	(0.013)	(0.003)*	(0.019)*	(0.014)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.044	0.000	-0.028	-0.061	-0.037
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.197
			(0.051)*			(0.036)*
Packet-based Connection			-0.530			-0.659
			(0.089)*			(0.088)*
Constant	5.505	5.651	5.791	6.159	6.429	6.279
	(0.088)*	(0.754)*	(0.518)*	(0.060)*	(0.304)*	(0.273)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	125.15	4.47	11.87	165.73	4.51	13.65
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 17a: Regression of Log Price on Competition in the Building and the Block with DOCSIS 3.0 Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Building	-0.047	-0.062	-0.021	-0.066	-0.048	-0.015
	(0.006)*	(0.047)	(0.038)	(0.011)*	(0.038)	(0.039)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.027	-0.112	0.056	-0.043	-0.122	0.062
	(0.006)*	(0.056)*	(0.034)	(0.009)*	(0.044)*	(0.032)*
DOCSIS 3.0 Available in the Census Block	-0.017	-0.178	-0.111	-0.047	-0.196	0.012
	(0.009)	(0.129)	(0.052)*	(0.014)*	(0.078)*	(0.061)
Customer is a Telecommunications Provider	-0.197	-0.027	0.135	-0.132	0.011	0.147
	(0.010)*	(0.042)	(0.049)*	(0.012)*	(0.037)	(0.057)*
Customer is a Mobile Telecommunications Provider	0.104	0.195	-0.201	0.150	0.200	-0.363
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.041)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.049	-0.463	-0.055	0.000	-0.466
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.175)*
Natural Log of Establishments in the Zip Code	0.009	0.032	-0.148	-0.020	0.075	-0.008
	(0.014)	(0.110)	(0.071)*	(0.010)*	(0.057)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.013	-0.034	0.055	-0.076	0.101	0.125
	(0.021)	(0.152)	(0.104)	(0.014)*	(0.071)	(0.055)*
Natural Log of Employment in the Zip Code	-0.008	0.083	0.065	0.038	-0.173	-0.114
	(0.029)	(0.204)	(0.146)	(0.018)*	(0.104)	(0.069)
Natural Log of Number of Establishments in the Census Block (D&B)	0.013	-0.007	0.004	0.022	0.076	0.022
	(0.002)*	(0.021)	(0.013)	(0.003)*	(0.019)*	(0.014)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.042	0.001	-0.027	-0.058	-0.038
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.197
			(0.051)*			(0.036)*
Packet-based Connection			-0.530			-0.659
			(0.089)*			(0.087)*
Constant	5.519	5.864	5.910	6.201	6.655	6.266
	(0.088)*	(0.753)*	(0.522)*	(0.055)*	(0.291)*	(0.283)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.11	0.29
F Statistic	113.77	4.06	11.73	151.16	4.44	12.65
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 17b: Regression of Log Price on Competition in the Building and the Block with Expansive Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Building	-0.047	-0.063	-0.024	-0.067	-0.048	-0.012
	(0.006)*	(0.047)	(0.038)	(0.011)*	(0.038)	(0.039)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.027	-0.116	0.056	-0.042	-0.123	0.065
	(0.006)*	(0.057)*	(0.034)	(0.008)*	(0.046)*	(0.032)*
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)	-0.012	-0.080	-0.109	-0.053	-0.065	-0.079
	(0.007)	(0.111)	(0.032)*	(0.010)*	(0.062)	(0.059)
Customer is a Telecommunications Provider	-0.197	-0.027	0.136	-0.133	0.010	0.145
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.104	0.195	-0.201	0.149	0.198	-0.366
	(0.006)*	(0.050)*	(0.104)	(0.008)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.049	-0.459	-0.055	-0.004	-0.467
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.175)*
Natural Log of Establishments in the Zip Code	0.009	0.039	-0.135	-0.019	0.071	-0.005
	(0.014)	(0.110)	(0.072)	(0.010)*	(0.056)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.013	-0.027	0.063	-0.077	0.114	0.120
	(0.021)	(0.152)	(0.104)	(0.014)*	(0.073)	(0.053)*
Natural Log of Employment in the Zip Code	-0.008	0.073	0.050	0.039	-0.182	-0.111
	(0.029)	(0.204)	(0.146)	(0.018)*	(0.105)	(0.068)
Natural Log of Number of Establishments in the Census Block (D&B)	0.013	-0.011	0.006	0.023	0.074	0.026
	(0.002)*	(0.022)	(0.013)	(0.003)*	(0.018)*	(0.015)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.042	-0.001	-0.027	-0.061	-0.037
	(0.002)*	(0.020)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.530			-0.656
			(0.089)*			(0.087)*
Constant	5.514	5.743	5.859	6.198	6.490	6.338
	(0.088)*	(0.752)*	(0.518)*	(0.056)*	(0.307)*	(0.267)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	113.79	4.15	12.43	151.21	4.35	12.63
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 17c: Regression of Log Price on Competition in the Building and the Block with Narrow Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Building	-0.047	-0.062	-0.024	-0.067	-0.048	-0.013
	(0.006)*	(0.047)	(0.038)	(0.011)*	(0.038)	(0.039)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.027	-0.118	0.055	-0.043	-0.124	0.064
	(0.006)*	(0.060)*	(0.034)	(0.009)*	(0.046)*	(0.032)*
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)	-0.009	0.037	-0.104	-0.044	-0.036	-0.052
	(0.007)	(0.065)	(0.031)*	(0.010)*	(0.057)	(0.059)
Customer is a Telecommunications Provider	-0.197	-0.025	0.136	-0.133	0.011	0.146
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.104	0.194	-0.201	0.149	0.198	-0.365
	(0.006)*	(0.050)*	(0.103)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.049	-0.459	-0.055	-0.005	-0.467
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.175)*
Natural Log of Establishments in the Zip Code	0.009	0.035	-0.134	-0.020	0.069	-0.005
	(0.015)	(0.108)	(0.072)	(0.010)*	(0.056)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.013	-0.020	0.063	-0.076	0.118	0.121
	(0.021)	(0.153)	(0.104)	(0.014)*	(0.073)	(0.054)*
Natural Log of Employment in the Zip Code	-0.008	0.069	0.050	0.038	-0.186	-0.112
	(0.029)	(0.205)	(0.147)	(0.018)*	(0.105)	(0.068)
Natural Log of Number of Establishments in the Census Block (D&B)	0.013	-0.019	0.005	0.023	0.073	0.025
	(0.002)*	(0.023)	(0.013)	(0.003)*	(0.018)*	(0.015)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.046	-0.001	-0.028	-0.062	-0.037
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.530			-0.657
			(0.089)*			(0.087)*
Constant	5.511	5.619	5.837	6.189	6.466	6.314
	(0.087)*	(0.756)*	(0.518)*	(0.056)*	(0.306)*	(0.268)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	113.83	4.17	12.59	151.63	4.43	12.58
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 18: Regression of Log Price on Competition in the Building, the Block, and the Tract (Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Building	-0.051	-0.074	-0.026	-0.069	-0.049	-0.023
	(0.007)*	(0.048)	(0.038)	(0.011)*	(0.038)	(0.038)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.033	-0.136	0.049	-0.049	-0.126	0.058
	(0.007)*	(0.062)*	(0.035)	(0.009)*	(0.046)*	(0.032)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.030	-0.210	-0.039	-0.039	-0.036	-0.073
	(0.007)*	(0.074)*	(0.042)	(0.009)*	(0.046)	(0.049)
Customer is a Telecommunications Provider	-0.197	-0.025	0.135	-0.133	0.011	0.146
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.202	0.148	0.198	-0.366
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.049	-0.462	-0.055	-0.006	-0.469
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.175)*
Natural Log of Establishments in the Zip Code	0.008	0.039	-0.144	-0.025	0.065	-0.008
	(0.014)	(0.109)	(0.070)*	(0.009)*	(0.056)	(0.043)
Natural Log of Annual Payroll in the Zip Code	-0.011	-0.023	0.064	-0.065	0.126	0.134
	(0.021)	(0.153)	(0.104)	(0.014)*	(0.074)	(0.056)*
Natural Log of Employment in the Zip Code	-0.009	0.069	0.055	0.032	-0.189	-0.120
	(0.029)	(0.206)	(0.146)	(0.018)	(0.105)	(0.070)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.020	-0.001	0.021	0.070	0.021
	(0.002)*	(0.022)	(0.013)	(0.003)*	(0.019)*	(0.014)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.047	0.001	-0.027	-0.060	-0.036
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.530			-0.658
			(0.089)*			(0.088)*
Constant	5.529	5.857	5.822	6.142	6.422	6.263
	(0.088)*	(0.759)*	(0.518)*	(0.059)*	(0.306)*	(0.276)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	113.85	4.39	11.37	154.89	4.29	12.89
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 18a: Regression of Log Price on Competition in the Building, the Block, and the Tract with DOCSIS 3.0 Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Building	-0.051	-0.074	-0.024	-0.069	-0.050	-0.023
	(0.007)*	(0.048)	(0.038)	(0.011)*	(0.038)	(0.037)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.033	-0.129	0.052	-0.048	-0.124	0.058
	(0.007)*	(0.058)*	(0.035)	(0.009)*	(0.045)*	(0.032)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.030	-0.211	-0.034	-0.041	-0.041	-0.073
	(0.007)*	(0.074)*	(0.041)	(0.009)*	(0.046)	(0.049)
DOCSIS 3.0 Available in the Census Block	-0.017	-0.178	-0.110	-0.049	-0.197	0.011
	(0.009)	(0.128)	(0.052)*	(0.014)*	(0.078)*	(0.061)
Customer is a Telecommunications Provider	-0.197	-0.026	0.135	-0.133	0.010	0.146
	(0.010)*	(0.042)	(0.049)*	(0.012)*	(0.037)	(0.056)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.201	0.148	0.199	-0.365
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.048	-0.462	-0.055	-0.000	-0.470
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.175)*
Natural Log of Establishments in the Zip Code	0.009	0.034	-0.147	-0.021	0.074	-0.009
	(0.014)	(0.110)	(0.071)*	(0.009)*	(0.056)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.012	-0.037	0.056	-0.069	0.107	0.135
	(0.021)	(0.152)	(0.104)	(0.014)*	(0.072)	(0.057)*
Natural Log of Employment in the Zip Code	-0.009	0.083	0.064	0.034	-0.177	-0.120
	(0.029)	(0.205)	(0.146)	(0.018)	(0.104)	(0.070)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.010	0.003	0.021	0.075	0.020
	(0.002)*	(0.021)	(0.013)	(0.003)*	(0.019)*	(0.014)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.045	0.002	-0.026	-0.057	-0.036
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.012)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.036)*
Packet-based Connection			-0.530			-0.658
			(0.089)*			(0.087)*
Constant	5.543	6.072	5.936	6.185	6.649	6.251
	(0.089)*	(0.763)*	(0.522)*	(0.055)*	(0.292)*	(0.286)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.11	0.29
F Statistic	104.35	4.03	11.23	142.42	4.27	12.03
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 18b: Regression of Log Price on Competition in the Building, the Block, and the Tract with Expansive Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Building	-0.051	-0.075	-0.027	-0.070	-0.050	-0.020
	(0.007)*	(0.048)	(0.038)	(0.011)*	(0.038)	(0.038)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.033	-0.133	0.051	-0.048	-0.125	0.061
	(0.007)*	(0.059)*	(0.035)	(0.009)*	(0.046)*	(0.032)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.030	-0.211	-0.040	-0.040	-0.036	-0.074
	(0.007)*	(0.074)*	(0.042)	(0.009)*	(0.046)	(0.048)
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)	-0.012	-0.081	-0.109	-0.053	-0.065	-0.079
	(0.007)	(0.110)	(0.032)*	(0.010)*	(0.062)	(0.059)
Customer is a Telecommunications Provider	-0.197	-0.026	0.136	-0.133	0.010	0.144
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.055)*
Customer is a Mobile Telecommunications Provider	0.103	0.194	-0.201	0.147	0.197	-0.369
	(0.006)*	(0.050)*	(0.104)	(0.008)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.048	-0.459	-0.055	-0.005	-0.471
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.175)*
Natural Log of Establishments in the Zip Code	0.009	0.041	-0.135	-0.021	0.070	-0.005
	(0.014)	(0.110)	(0.072)	(0.009)*	(0.055)	(0.043)
Natural Log of Annual Payroll in the Zip Code	-0.012	-0.029	0.064	-0.070	0.119	0.130
	(0.021)	(0.152)	(0.104)	(0.014)*	(0.074)	(0.055)*
Natural Log of Employment in the Zip Code	-0.008	0.073	0.049	0.035	-0.185	-0.118
	(0.029)	(0.205)	(0.146)	(0.018)	(0.105)	(0.069)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.015	0.005	0.022	0.074	0.024
	(0.002)*	(0.022)	(0.013)	(0.003)*	(0.019)*	(0.015)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.045	-0.001	-0.026	-0.060	-0.035
	(0.002)*	(0.020)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.035)*
Packet-based Connection			-0.530			-0.656
			(0.089)*			(0.087)*
Constant	5.538	5.951	5.890	6.181	6.484	6.323
	(0.088)*	(0.761)*	(0.518)*	(0.056)*	(0.309)*	(0.270)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	104.37	4.13	11.90	142.52	4.21	11.93
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 18c: Regression of Log Price on Competition in the Building, the Block, and the Tract with Narrow Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	Hi-Band Tract FE	DS-1 County FE	DS-3 County FE	Hi-Band County FE
A Facilities-based Competitor is in the Building	-0.051	-0.074	-0.027	-0.070	-0.050	-0.021
	(0.007)*	(0.048)	(0.038)	(0.011)*	(0.038)	(0.038)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.033	-0.136	0.051	-0.048	-0.126	0.060
	(0.007)*	(0.062)*	(0.035)	(0.009)*	(0.046)*	(0.032)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.030	-0.209	-0.040	-0.040	-0.036	-0.074
	(0.007)*	(0.074)*	(0.042)	(0.009)*	(0.046)	(0.049)
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)	-0.009	0.035	-0.104	-0.044	-0.036	-0.053
	(0.007)	(0.065)	(0.031)*	(0.010)*	(0.057)	(0.058)
Customer is a Telecommunications Provider	-0.197	-0.025	0.136	-0.133	0.010	0.144
	(0.010)*	(0.043)	(0.049)*	(0.012)*	(0.037)	(0.055)*
Customer is a Mobile Telecommunications Provider	0.103	0.193	-0.201	0.147	0.198	-0.368
	(0.006)*	(0.050)*	(0.104)	(0.009)*	(0.042)*	(0.062)*
Customer is a Cable Operator	-0.073	-0.048	-0.459	-0.055	-0.005	-0.470
	(0.009)*	(0.046)	(0.256)	(0.010)*	(0.047)	(0.175)*
Natural Log of Establishments in the Zip Code	0.009	0.037	-0.134	-0.022	0.068	-0.006
	(0.014)	(0.109)	(0.072)	(0.009)*	(0.056)	(0.044)
Natural Log of Annual Payroll in the Zip Code	-0.012	-0.022	0.064	-0.068	0.123	0.131
	(0.021)	(0.153)	(0.104)	(0.014)*	(0.074)	(0.055)*
Natural Log of Employment in the Zip Code	-0.009	0.069	0.049	0.034	-0.189	-0.118
	(0.029)	(0.205)	(0.147)	(0.018)	(0.105)	(0.069)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.022	0.005	0.022	0.072	0.023
	(0.002)*	(0.023)	(0.013)	(0.003)*	(0.019)*	(0.015)
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.048	-0.001	-0.027	-0.060	-0.036
	(0.002)*	(0.019)*	(0.012)	(0.002)*	(0.015)*	(0.011)*
Natural Log of Mbps			0.247			0.198
			(0.051)*			(0.035)*
Packet-based Connection			-0.530			-0.657
			(0.089)*			(0.087)*
Constant	5.535	5.827	5.869	6.172	6.460	6.299
	(0.088)*	(0.761)*	(0.518)*	(0.056)*	(0.308)*	(0.271)*
Adjusted R-Squared	0.33	0.26	0.45	0.18	0.10	0.29
F Statistic	104.41	4.12	12.06	143.04	4.33	11.95
Observations	1,399,170	120,110	80,318	1,399,170	120,110	80,318

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 19: Regression of Log Price on Number of Competitors in the Census Block (Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	DS-1 County FE	DS-3 County FE
A Facilities-based Competitor is in the Building	-0.048	-0.066	-0.065	-0.052
	(0.006)*	(0.046)	(0.011)*	(0.037)
One Facilities-based Competitor is in the Block But Not the Building	-0.018	-0.095	-0.028	-0.070
	(0.005)*	(0.070)	(0.009)*	(0.046)
Two or Three Facilities-based Competitors are in the Block But Not the Building	-0.051	-0.154	-0.075	-0.160
	(0.010)*	(0.070)*	(0.015)*	(0.058)*
Four or More Facilities-based Competitors are in the Block But Not the Building	-0.040	-0.132	-0.065	-0.280
	(0.025)	(0.092)	(0.025)*	(0.107)*
Customer is a Telecommunications Provider	-0.197	-0.025	-0.132	0.010
	(0.010)*	(0.043)	(0.012)*	(0.037)
Customer is a Mobile Telecommunications Provider	0.103	0.195	0.149	0.194
	(0.006)*	(0.050)*	(0.009)*	(0.041)*
Customer is a Cable Operator	-0.073	-0.049	-0.056	-0.010
	(0.009)*	(0.046)	(0.010)*	(0.047)
Natural Log of Establishments in the Zip Code	0.008	0.038	-0.025	0.064
	(0.014)	(0.110)	(0.009)*	(0.055)
Natural Log of Annual Payroll in the Zip Code	-0.008	-0.011	-0.068	0.144
	(0.022)	(0.155)	(0.014)*	(0.074)
Natural Log of Employment in the Zip Code	-0.011	0.057	0.034	-0.209
	(0.030)	(0.208)	(0.018)	(0.107)
Natural Log of Number of Establishments in the Census Block (D&B)	0.013	-0.014	0.023	0.080
	(0.002)*	(0.022)	(0.004)*	(0.020)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.043	-0.028	-0.060
	(0.002)*	(0.019)*	(0.002)*	(0.015)*
Constant	5.490	5.619	6.135	6.327
	(0.088)*	(0.763)*	(0.061)*	(0.308)*
Adjusted R-Squared	0.33	0.26	0.18	0.11
F Statistic	105.22	4.04	145.77	4.15
Observations	1,399,170	120,110	1,399,170	120,110

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 19a: Regression of Log Price on Number of Competitors in the Census Block with DOCSIS 3.0 Indicator

	DS-1 Tract FE	DS-3 Tract FE	DS-1 County FE	DS-3 County FE
A Facilities-based Competitor is in the Building	-0.048	-0.064	-0.065	-0.053
	(0.006)*	(0.046)	(0.011)*	(0.037)
One Facilities-based Competitor is in the Block But Not the Building	-0.018	-0.090	-0.028	-0.068
	(0.005)*	(0.065)	(0.009)*	(0.046)
Two or Three Facilities-based Competitors are in the Block But Not the Building	-0.051	-0.147	-0.074	-0.158
	(0.010)*	(0.069)*	(0.014)*	(0.057)*
Four or More Facilities-based Competitors are in the Block But Not the Building	-0.039	-0.117	-0.064	-0.274
	(0.025)	(0.091)	(0.025)*	(0.106)*
DOCSIS 3.0 Available in the Census Block	-0.017	-0.178	-0.047	-0.192
	(0.009)	(0.132)	(0.014)*	(0.078)*
Customer is a Telecommunications Provider	-0.197	-0.026	-0.132	0.009
	(0.010)*	(0.043)	(0.012)*	(0.037)
Customer is a Mobile Telecommunications Provider	0.104	0.196	0.149	0.196
	(0.006)*	(0.050)*	(0.009)*	(0.041)*
Customer is a Cable Operator	-0.073	-0.049	-0.055	-0.005
	(0.009)*	(0.046)	(0.010)*	(0.046)
Natural Log of Establishments in the Zip Code	0.008	0.033	-0.021	0.072
	(0.014)	(0.111)	(0.010)*	(0.056)
Natural Log of Annual Payroll in the Zip Code	-0.009	-0.025	-0.072	0.125
	(0.022)	(0.154)	(0.014)*	(0.072)
Natural Log of Employment in the Zip Code	-0.011	0.073	0.036	-0.196
	(0.030)	(0.207)	(0.018)*	(0.105)
Natural Log of Number of Establishments in the Census Block (D&B)	0.014	-0.005	0.024	0.085
	(0.002)*	(0.021)	(0.003)*	(0.020)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.041	-0.027	-0.057
	(0.002)*	(0.019)*	(0.002)*	(0.014)*
Constant	5.504	5.830	6.177	6.551
	(0.088)*	(0.763)*	(0.056)*	(0.292)*
Adjusted R-Squared	0.33	0.26	0.18	0.11
F Statistic	97.11	3.74	134.99	4.08
Observations	1,399,170	120,110	1,399,170	120,110

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 19b: Regression of Log Price on Number of Competitors in the Census Block with Expansive Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	DS-1 County FE	DS-3 County FE
A Facilities-based Competitor is in the Building	-0.048	-0.066	-0.066	-0.053
	(0.006)*	(0.046)	(0.011)*	(0.037)
One Facilities-based Competitor is in the Block But Not the Building	-0.018	-0.092	-0.027	-0.069
	(0.005)*	(0.066)	(0.009)*	(0.046)
Two or Three Facilities-based Competitors are in the Block But Not the Building	-0.051	-0.153	-0.075	-0.159
	(0.010)*	(0.070)*	(0.014)*	(0.058)*
Four or More Facilities-based Competitors are in the Block But Not the Building	-0.039	-0.126	-0.063	-0.278
	(0.025)	(0.091)	(0.025)*	(0.109)*
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)	-0.012	-0.082	-0.053	-0.064
	(0.007)	(0.111)	(0.010)*	(0.062)
Customer is a Telecommunications Provider	-0.197	-0.026	-0.133	0.009
	(0.010)*	(0.043)	(0.012)*	(0.037)
Customer is a Mobile Telecommunications Provider	0.103	0.195	0.148	0.194
	(0.006)*	(0.050)*	(0.008)*	(0.041)*
Customer is a Cable Operator	-0.073	-0.049	-0.056	-0.009
	(0.009)*	(0.046)	(0.010)*	(0.047)
Natural Log of Establishments in the Zip Code	0.009	0.040	-0.021	0.068
	(0.014)	(0.111)	(0.009)*	(0.055)
Natural Log of Annual Payroll in the Zip Code	-0.009	-0.017	-0.073	0.137
	(0.022)	(0.154)	(0.014)*	(0.074)
Natural Log of Employment in the Zip Code	-0.011	0.062	0.037	-0.205
	(0.030)	(0.207)	(0.018)*	(0.107)
Natural Log of Number of Establishments in the Census Block (D&B)	0.014	-0.009	0.025	0.083
	(0.002)*	(0.022)	(0.003)*	(0.019)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.041	-0.027	-0.060
	(0.002)*	(0.019)*	(0.002)*	(0.015)*
Constant	5.499	5.711	6.174	6.389
	(0.088)*	(0.762)*	(0.057)*	(0.314)*
Adjusted R-Squared	0.33	0.26	0.18	0.11
F Statistic	97.16	3.74	135.00	4.13
Observations	1,399,170	120,110	1,399,170	120,110

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 19c: Regression of Log Price on Number of Competitors in the Census Block with Narrow Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	DS-1 County FE	DS-3 County FE
A Facilities-based Competitor is in the Building	-0.048	-0.066	-0.066	-0.053
	(0.006)*	(0.046)	(0.011)*	(0.037)
One Facilities-based Competitor is in the Block But Not the Building	-0.018	-0.096	-0.027	-0.070
	(0.005)*	(0.070)	(0.009)*	(0.046)
Two or Three Facilities-based Competitors are in the Block But Not the Building	-0.051	-0.154	-0.075	-0.160
	(0.010)*	(0.070)*	(0.014)*	(0.058)*
Four or More Facilities-based Competitors are in the Block But Not the Building	-0.039	-0.134	-0.063	-0.279
	(0.025)	(0.092)	(0.025)*	(0.108)*
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)	-0.009	0.035	-0.044	-0.034
	(0.007)	(0.066)	(0.010)*	(0.057)
Customer is a Telecommunications Provider	-0.197	-0.025	-0.133	0.009
	(0.010)*	(0.043)	(0.012)*	(0.037)
Customer is a Mobile Telecommunications Provider	0.103	0.195	0.148	0.194
	(0.006)*	(0.050)*	(0.009)*	(0.041)*
Customer is a Cable Operator	-0.073	-0.049	-0.056	-0.010
	(0.009)*	(0.046)	(0.010)*	(0.047)
Natural Log of Establishments in the Zip Code	0.009	0.036	-0.022	0.066
	(0.014)	(0.110)	(0.010)*	(0.055)
Natural Log of Annual Payroll in the Zip Code	-0.009	-0.010	-0.072	0.142
	(0.022)	(0.155)	(0.014)*	(0.074)
Natural Log of Employment in the Zip Code	-0.011	0.058	0.036	-0.209
	(0.030)	(0.208)	(0.018)*	(0.107)
Natural Log of Number of Establishments in the Census Block (D&B)	0.014	-0.016	0.025	0.082
	(0.002)*	(0.023)	(0.003)*	(0.019)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.044	-0.028	-0.060
	(0.002)*	(0.019)*	(0.002)*	(0.015)*
Constant	5.496	5.591	6.165	6.363
	(0.087)*	(0.765)*	(0.057)*	(0.312)*
Adjusted R-Squared	0.33	0.26	0.18	0.11
F Statistic	97.20	3.81	135.89	4.12
Observations	1,399,170	120,110	1,399,170	120,110

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 20: Regression of Log Price on Competition in the Block, by Price Flex Regulation (Rysman Paper)

	DS-1 Tract FE	DS-3 Tract FE	DS-1 County FE	DS-3 County FE
A Facilities-based Competitor is in the Census Block	0.001	0.126	-0.009	0.060
	(0.008)	(0.059)*	(0.017)	(0.052)
Phase 1 x Facilities-based Competitor in Census Block	-0.038	-0.337	-0.073	-0.221
	(0.010)*	(0.081)*	(0.021)*	(0.076)*
Phase 2 x Facilities-based Competitor in Census Block	-0.048	-0.265	-0.040	-0.191
	(0.013)*	(0.084)*	(0.022)	(0.065)*
Customer is a Telecommunications Provider	-0.196	-0.024	-0.130	0.012
	(0.010)*	(0.042)	(0.012)*	(0.037)
Customer is a Mobile Telecommunications Provider	0.103	0.195	0.148	0.200
	(0.006)*	(0.050)*	(0.009)*	(0.041)*
Customer is a Cable Operator	-0.073	-0.051	-0.054	-0.004
	(0.009)*	(0.046)	(0.010)*	(0.047)
Natural Log of Establishments in the Zip Code	0.009	0.037	-0.024	0.069
	(0.015)	(0.109)	(0.009)*	(0.057)
Natural Log of Annual Payroll in the Zip Code	-0.015	-0.039	-0.079	0.118
	(0.022)	(0.148)	(0.014)*	(0.074)
Natural Log of Employment in the Zip Code	-0.005	0.083	0.043	-0.185
	(0.030)	(0.200)	(0.019)*	(0.107)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.025	0.021	0.063
	(0.002)*	(0.025)	(0.004)*	(0.019)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.046	-0.030	-0.060
	(0.001)*	(0.019)*	(0.002)*	(0.015)*
Constant	5.515	5.775	6.190	6.465
	(0.089)*	(0.749)*	(0.061)*	(0.311)*
Adjusted R-Squared	0.33	0.26	0.18	0.10
F Statistic	112.41	6.10	155.25	4.68
Observations	1,399,170	120,110	1,399,170	120,110

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 20a: Regression of Log Price on Competition in the Block, by Price Flex Regulation with DOCSIS 3.0 Indicator

	DS-1 Tract FE	DS-3 Tract FE	DS-1 County FE	DS-3 County FE
A Facilities-based Competitor is in the Census Block	-0.005	0.064	-0.025	0.035
	(0.007)	(0.056)	(0.015)	(0.057)
Phase 1 x Facilities-based Competitor in Census Block	-0.029	-0.177	-0.049	-0.172
	(0.009)*	(0.088)*	(0.018)*	(0.080)*
Phase 2 x Facilities-based Competitor in Census Block	-0.043	-0.260	-0.023	-0.176
	(0.012)*	(0.082)*	(0.019)	(0.071)*
DOCSIS 3.0 Available in the Census Block	0.028	0.162	0.017	-0.022
	(0.018)	(0.116)	(0.019)	(0.080)
Phase 1 x DOCSIS 3.0 in Census Block	-0.070	-0.694	-0.105	-0.317
	(0.022)*	(0.175)*	(0.026)*	(0.113)*
Phase 2 x DOCSIS 3.0 in Census Block	-0.026	0.114	-0.038	-0.011
	(0.023)	(0.128)	(0.021)	(0.088)
Customer is a Telecommunications Provider	-0.195	-0.023	-0.129	0.013
	(0.010)*	(0.042)	(0.012)*	(0.037)
Customer is a Mobile Telecommunications Provider	0.103	0.194	0.149	0.202
	(0.006)*	(0.050)*	(0.009)*	(0.041)*
Customer is a Cable Operator	-0.072	-0.049	-0.051	0.002
	(0.009)*	(0.046)	(0.010)*	(0.047)
Natural Log of Establishments in the Zip Code	0.009	0.010	-0.021	0.075
	(0.015)	(0.112)	(0.010)*	(0.057)
Natural Log of Annual Payroll in the Zip Code	-0.015	-0.032	-0.084	0.095
	(0.022)	(0.145)	(0.013)*	(0.071)
Natural Log of Employment in the Zip Code	-0.005	0.082	0.046	-0.171
	(0.030)	(0.199)	(0.018)*	(0.105)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.012	0.022	0.071
	(0.002)*	(0.022)	(0.003)*	(0.019)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.006	0.049	-0.028	-0.058
	(0.001)*	(0.019)*	(0.002)*	(0.015)*
Constant	5.524	5.898	6.233	6.698
	(0.089)*	(0.726)*	(0.055)*	(0.293)*
Adjusted R-Squared	0.33	0.26	0.18	0.11
F Statistic	88.57	6.22	127.36	4.44
Observations	1,399,170	120,110	1,399,170	120,110

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 20b: Regression of Log Price on Competition in the Block, by Price Flex Regulation with Expansive Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	DS-1 County FE	DS-3 County FE
A Facilities-based Competitor is in the Census Block	-0.005	0.086	-0.031	0.044
	(0.008)	(0.056)	(0.015)*	(0.056)
Phase 1 x Facilities-based Competitor in Census Block	-0.029	-0.235	-0.042	-0.194
	(0.009)*	(0.087)*	(0.018)*	(0.085)*
Phase 2 x Facilities-based Competitor in Census Block	-0.041	-0.263	-0.014	-0.177
	(0.012)*	(0.082)*	(0.019)	(0.070)*
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)	0.037	0.122	0.028	0.023
	(0.016)*	(0.104)	(0.016)	(0.065)
Phase 1 x Metro Ethernet (Expansive) in Census Block	-0.066	-0.483	-0.117	-0.139
	(0.019)*	(0.180)*	(0.022)*	(0.117)
Phase 2 x Metro Ethernet (Expansive) in Census Block	-0.037	0.084	-0.063	-0.051
	(0.021)	(0.118)	(0.019)*	(0.076)
Customer is a Telecommunications Provider	-0.195	-0.026	-0.129	0.012
	(0.010)*	(0.042)	(0.012)*	(0.037)
Customer is a Mobile Telecommunications Provider	0.103	0.195	0.147	0.199
	(0.006)*	(0.050)*	(0.008)*	(0.041)*
Customer is a Cable Operator	-0.073	-0.049	-0.051	-0.003
	(0.009)*	(0.046)	(0.010)*	(0.047)
Natural Log of Establishments in the Zip Code	0.009	0.032	-0.021	0.075
	(0.015)	(0.111)	(0.009)*	(0.056)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.015	-0.084	0.109
	(0.022)	(0.146)	(0.014)*	(0.073)
Natural Log of Employment in the Zip Code	-0.004	0.059	0.047	-0.180
	(0.030)	(0.200)	(0.018)*	(0.106)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.016	0.023	0.067
	(0.002)*	(0.022)	(0.003)*	(0.019)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.043	-0.029	-0.060
	(0.001)*	(0.019)*	(0.002)*	(0.015)*
Constant	5.518	5.762	6.229	6.532
	(0.089)*	(0.729)*	(0.056)*	(0.311)*
Adjusted R-Squared	0.33	0.26	0.18	0.10
F Statistic	89.47	5.73	128.44	4.28
Observations	1,399,170	120,110	1,399,170	120,110

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 20c: Regression of Log Price on Competition in the Block, by Price Flex Regulation with Narrow Metro Ethernet Indicator

	DS-1 Tract FE	DS-3 Tract FE	DS-1 County FE	DS-3 County FE
A Facilities-based Competitor is in the Census Block	-0.007	0.125	-0.043	0.059
	(0.008)	(0.057)*	(0.014)*	(0.054)
Phase 1 x Facilities-based Competitor in Census Block	-0.026	-0.309	-0.031	-0.215
	(0.010)*	(0.083)*	(0.018)	(0.082)*
Phase 2 x Facilities-based Competitor in Census Block	-0.039	-0.294	0.003	-0.191
	(0.013)*	(0.083)*	(0.019)	(0.067)*
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)	0.067	0.070	0.080	-0.014
	(0.016)*	(0.093)	(0.017)*	(0.053)
Phase 1 x Metro Ethernet (Narrow) in Census Block	-0.096	-0.183	-0.158	-0.042
	(0.018)*	(0.120)	(0.023)*	(0.102)
Phase 2 x Metro Ethernet (Narrow) in Census Block	-0.065	0.163	-0.121	0.005
	(0.021)*	(0.113)	(0.021)*	(0.071)
Customer is a Telecommunications Provider	-0.195	-0.024	-0.130	0.012
	(0.010)*	(0.042)	(0.012)*	(0.037)
Customer is a Mobile Telecommunications Provider	0.103	0.195	0.147	0.200
	(0.006)*	(0.050)*	(0.008)*	(0.041)*
Customer is a Cable Operator	-0.072	-0.051	-0.051	-0.004
	(0.009)*	(0.046)	(0.010)*	(0.047)
Natural Log of Establishments in the Zip Code	0.009	0.036	-0.021	0.072
	(0.015)	(0.110)	(0.009)*	(0.056)
Natural Log of Annual Payroll in the Zip Code	-0.016	-0.011	-0.084	0.113
	(0.022)	(0.148)	(0.013)*	(0.073)
Natural Log of Employment in the Zip Code	-0.004	0.054	0.047	-0.183
	(0.030)	(0.201)	(0.017)*	(0.106)
Natural Log of Number of Establishments in the Census Block (D&B)	0.012	-0.026	0.023	0.065
	(0.002)*	(0.026)	(0.003)*	(0.019)*
Natural Log of Establishments (D&B) per Square Mile in the Census Block	-0.007	0.047	-0.029	-0.061
	(0.001)*	(0.019)*	(0.002)*	(0.015)*
Constant	5.513	5.644	6.224	6.505
	(0.089)*	(0.753)*	(0.056)*	(0.311)*
Adjusted R-Squared	0.33	0.26	0.18	0.10
F Statistic	91.00	5.61	135.73	3.99
Observations	1,399,170	120,110	1,399,170	120,110

* $p<0.05$

Clustered standard errors in parentheses allow for correlated error terms within a census block

Table 1.1a: Regression of Log of ILEC DS-1 Price on Competition in the Block including Cable Indicators
Price Cap Areas

	DS-1	DS-1	DS-1	DS-1
A Facilities-based Competitor is in the Census Block	-0.014	-0.014	-0.014	-0.014
	(0.005)*	(0.005)*	(0.005)*	(0.005)*
Customer is a Telecommunications Provider	-0.089	-0.089	-0.089	-0.089
	(0.011)*	(0.011)*	(0.011)*	(0.011)*
Customer is a Mobile Telecommunications Provider	0.034	0.034	0.034	0.034
	(0.005)*	(0.005)*	(0.005)*	(0.005)*
Customer is a Cable Operator	-0.159	-0.159	-0.159	-0.159
	(0.040)*	(0.040)*	(0.040)*	(0.040)*
Log of Establishments per Square Mile in the Zip Code	0.025	0.026	0.026	0.025
	(0.014)	(0.014)	(0.014)	(0.014)
Log of Employment per Square Mile in the Zip Code	-0.055	-0.054	-0.055	-0.055
	(0.011)*	(0.011)*	(0.011)*	(0.011)*
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	-0.022	-0.022	-0.022	-0.022
	(0.021)	(0.021)	(0.021)	(0.021)
DOCSIS 3.0 Available in the Census Block		-0.011		
		(0.008)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.006	
			(0.009)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				0.002
				(0.011)
Constant	5.752	5.758	5.754	5.751
	(0.070)*	(0.070)*	(0.070)*	(0.070)*
Adjusted R-Squared	0.44	0.44	0.44	0.44
F Statistic	35.83	31.35	31.37	31.49
Observations	579,119	579,119	579,119	579,119

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 1.1b: Regression of Log of ILEC DS-1 Price on Competition in the Block including Cable Indicators
Phase I Areas

	DS-1	DS-1	DS-1	DS-1
A Facilities-based Competitor is in the Census Block	-0.012	-0.011	-0.012	-0.012
	(0.006)	(0.007)	(0.007)	(0.006)
Customer is a Telecommunications Provider	-0.259	-0.259	-0.259	-0.259
	(0.014)*	(0.014)*	(0.014)*	(0.014)*
Customer is a Mobile Telecommunications Provider	0.138	0.138	0.138	0.138
	(0.009)*	(0.009)*	(0.009)*	(0.009)*
Customer is a Cable Operator	-0.053	-0.053	-0.053	-0.053
	(0.010)*	(0.010)*	(0.010)*	(0.010)*
Log of Establishments per Square Mile in the Zip Code	0.017	0.017	0.017	0.017
	(0.030)	(0.030)	(0.030)	(0.030)
Log of Employment per Square Mile in the Zip Code	-0.029	-0.030	-0.029	-0.029
	(0.019)	(0.019)	(0.019)	(0.019)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.017	0.016	0.016	0.017
	(0.043)	(0.043)	(0.043)	(0.043)
DOCSIS 3.0 Available in the Census Block		-0.016		
		(0.010)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.005	
			(0.008)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				0.002
				(0.008)
Constant	5.376	5.392	5.381	5.375
	(0.220)*	(0.219)*	(0.220)*	(0.220)*
Adjusted R-Squared	0.29	0.29	0.29	0.29
F Statistic	142.27	127.21	128.17	129.63
Observations	679,520	679,520	679,520	679,520

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 1.1c: Regression of Log of ILEC DS-1 Price on Competition in the Block including Cable Indicators
Phase II Areas

	DS-1	DS-1	DS-1	DS-1
A Facilities-based Competitor is in the Census Block	-0.044	-0.043	-0.043	-0.044
	(0.008)*	(0.008)*	(0.008)*	(0.008)*
Customer is a Telecommunications Provider	-0.087	-0.087	-0.087	-0.087
	(0.016)*	(0.016)*	(0.016)*	(0.016)*
Customer is a Mobile Telecommunications Provider	0.098	0.098	0.098	0.098
	(0.010)*	(0.010)*	(0.010)*	(0.010)*
Customer is a Cable Operator	-0.069	-0.069	-0.069	-0.069
	(0.012)*	(0.012)*	(0.012)*	(0.012)*
Log of Establishments per Square Mile in the Zip Code	0.019	0.019	0.019	0.019
	(0.023)	(0.023)	(0.023)	(0.023)
Log of Employment per Square Mile in the Zip Code	-0.013	-0.013	-0.013	-0.013
	(0.018)	(0.018)	(0.018)	(0.018)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.064	0.064	0.064	0.064
	(0.034)	(0.034)	(0.034)	(0.034)
DOCSIS 3.0 Available in the Census Block		-0.026		
		(0.016)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.006	
			(0.014)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.005
				(0.016)
Constant	5.029	5.052	5.034	5.032
	(0.143)*	(0.143)*	(0.142)*	(0.142)*
Adjusted R-Squared	0.38	0.38	0.38	0.38
F Statistic	47.78	42.15	41.94	41.93
Observations	548,020	548,020	548,020	548,020

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 1.2a: Regression of Log of ILEC DS-1 Price on Competition and Fiber in the Block including Cable Indicators
Price Cap Areas

	DS-1	DS-1	DS-1	DS-1
A Facilities-based Competitor is in the Census Block	-0.013	-0.013	-0.013	-0.013
	(0.005)*	(0.005)*	(0.005)*	(0.005)*
An Indep. CLEC Has a Fiber Network in the Census Block	-0.009	-0.009	-0.009	-0.010
	(0.006)	(0.005)	(0.005)	(0.005)
Customer is a Telecommunications Provider	-0.089	-0.089	-0.089	-0.089
	(0.011)*	(0.011)*	(0.011)*	(0.011)*
Customer is a Mobile Telecommunications Provider	0.034	0.034	0.034	0.034
	(0.005)*	(0.005)*	(0.005)*	(0.005)*
Customer is a Cable Operator	-0.159	-0.159	-0.159	-0.159
	(0.040)*	(0.040)*	(0.040)*	(0.040)*
Log of Establishments per Square Mile in the Zip Code	0.025	0.026	0.026	0.025
	(0.014)	(0.014)	(0.014)	(0.014)
Log of Employment per Square Mile in the Zip Code	-0.054	-0.054	-0.054	-0.054
	(0.011)*	(0.011)*	(0.011)*	(0.011)*
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	-0.022	-0.022	-0.022	-0.022
	(0.021)	(0.021)	(0.021)	(0.021)
DOCSIS 3.0 Available in the Census Block		-0.009		
		(0.008)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.005	
			(0.009)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				0.004
				(0.011)
Constant	5.757	5.762	5.759	5.756
	(0.070)*	(0.070)*	(0.070)*	(0.070)*
Adjusted R-Squared	0.44	0.44	0.44	0.44
F Statistic	31.53	28.05	28.09	28.26
Observations	579,119	579,119	579,119	579,119

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 1.2b: Regression of Log of ILEC DS-1 Price on Competition and Fiber in the Block including Cable Indicators
Phase I Areas

	DS-1	DS-1	DS-1	DS-1
A Facilities-based Competitor is in the Census Block	-0.012	-0.011	-0.012	-0.012
	(0.007)	(0.007)	(0.007)	(0.007)
An Indep. CLEC Has a Fiber Network in the Census Block	0.003	0.005	0.004	0.003
	(0.006)	(0.006)	(0.006)	(0.006)
Customer is a Telecommunications Provider	-0.259	-0.259	-0.259	-0.259
	(0.014)*	(0.014)*	(0.014)*	(0.014)*
Customer is a Mobile Telecommunications Provider	0.138	0.138	0.138	0.138
	(0.009)*	(0.009)*	(0.009)*	(0.009)*
Customer is a Cable Operator	-0.053	-0.053	-0.053	-0.053
	(0.010)*	(0.010)*	(0.010)*	(0.010)*
Log of Establishments per Square Mile in the Zip Code	0.017	0.017	0.017	0.017
	(0.030)	(0.030)	(0.030)	(0.030)
Log of Employment per Square Mile in the Zip Code	-0.029	-0.029	-0.029	-0.029
	(0.019)	(0.019)	(0.019)	(0.019)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.017	0.016	0.016	0.017
	(0.043)	(0.043)	(0.043)	(0.043)
DOCSIS 3.0 Available in the Census Block		-0.017		
		(0.011)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.005	
			(0.008)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				0.002
				(0.008)
Constant	5.374	5.389	5.378	5.373
	(0.219)*	(0.218)*	(0.219)*	(0.219)*
Adjusted R-Squared	0.29	0.29	0.29	0.29
F Statistic	124.50	113.07	113.92	115.22
Observations	679,520	679,520	679,520	679,520

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 1.2c: Regression of Log of ILEC DS-1 Price on Competition and Fiber in the Block including Cable Indicators
Phase II Areas

	DS-1	DS-1	DS-1	DS-1
A Facilities-based Competitor is in the Census Block	-0.045	-0.044	-0.045	-0.045
	(0.008)*	(0.008)*	(0.008)*	(0.008)*
An Indep. CLEC Has a Fiber Network in the Census Block	0.009	0.011	0.010	0.010
	(0.010)	(0.011)	(0.011)	(0.011)
Customer is a Telecommunications Provider	-0.087	-0.087	-0.087	-0.087
	(0.016)*	(0.016)*	(0.016)*	(0.016)*
Customer is a Mobile Telecommunications Provider	0.098	0.098	0.098	0.098
	(0.010)*	(0.010)*	(0.010)*	(0.010)*
Customer is a Cable Operator	-0.069	-0.069	-0.069	-0.069
	(0.012)*	(0.012)*	(0.012)*	(0.012)*
Log of Establishments per Square Mile in the Zip Code	0.019	0.019	0.019	0.019
	(0.023)	(0.023)	(0.023)	(0.023)
Log of Employment per Square Mile in the Zip Code	-0.013	-0.013	-0.013	-0.013
	(0.018)	(0.018)	(0.018)	(0.018)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.064	0.064	0.064	0.064
	(0.034)	(0.034)	(0.034)	(0.034)
DOCSIS 3.0 Available in the Census Block		-0.027		
		(0.016)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.006	
			(0.014)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.005
				(0.016)
Constant	5.021	5.043	5.026	5.025
	(0.143)*	(0.143)*	(0.142)*	(0.142)*
Adjusted R-Squared	0.38	0.38	0.38	0.38
F Statistic	42.07	37.61	37.46	37.44
Observations	548,020	548,020	548,020	548,020

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 1.3a: Regression of Log of ILEC DS-1 Price on Competition in the Building, Block, and Tract including Cable Indicators
Price Cap Areas

	DS-1	DS-1	DS-1	DS-1
A Facilities-based Competitor is in the Building	-0.029	-0.029	-0.029	-0.029
	(0.010)*	(0.010)*	(0.010)*	(0.010)*
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.011	-0.011	-0.011	-0.011
	(0.007)	(0.007)	(0.007)	(0.007)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.005	-0.005	-0.005	-0.005
	(0.009)	(0.009)	(0.009)	(0.009)
Customer is a Telecommunications Provider	-0.089	-0.089	-0.089	-0.089
	(0.011)*	(0.011)*	(0.011)*	(0.011)*
Customer is a Mobile Telecommunications Provider	0.034	0.034	0.034	0.034
	(0.005)*	(0.005)*	(0.005)*	(0.005)*
Customer is a Cable Operator	-0.158	-0.158	-0.158	-0.158
	(0.040)*	(0.040)*	(0.040)*	(0.040)*
Log of Establishments per Square Mile in the Zip Code	0.025	0.026	0.025	0.025
	(0.014)	(0.014)	(0.014)	(0.014)
Log of Employment per Square Mile in the Zip Code	-0.054	-0.054	-0.054	-0.054
	(0.011)*	(0.011)*	(0.011)*	(0.011)*
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	-0.022	-0.022	-0.021	-0.022
	(0.021)	(0.021)	(0.021)	(0.021)
DOCSIS 3.0 Available in the Census Block		-0.011		
		(0.008)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.006	
			(0.009)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				0.002
				(0.011)
Constant	5.756	5.762	5.758	5.755
	(0.070)*	(0.071)*	(0.070)*	(0.070)*
Adjusted R-Squared	0.44	0.44	0.44	0.44
F Statistic	28.32	25.49	25.51	25.60
Observations	579,119	579,119	579,119	579,119

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 1.3b: Regression of Log of ILEC DS-1 Price on Competition in the Building, Block, and Tract including Cable Indicators
Phase I Areas

	DS-1	DS-1	DS-1	DS-1
A Facilities-based Competitor is in the Building	-0.036	-0.036	-0.036	-0.036
	(0.009)*	(0.009)*	(0.009)*	(0.009)*
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.024	-0.023	-0.024	-0.024
	(0.010)*	(0.010)*	(0.010)*	(0.010)*
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.035	-0.035	-0.035	-0.035
	(0.011)*	(0.011)*	(0.011)*	(0.011)*
Customer is a Telecommunications Provider	-0.260	-0.260	-0.260	-0.260
	(0.014)*	(0.014)*	(0.014)*	(0.014)*
Customer is a Mobile Telecommunications Provider	0.138	0.138	0.138	0.138
	(0.009)*	(0.009)*	(0.009)*	(0.009)*
Customer is a Cable Operator	-0.054	-0.054	-0.054	-0.054
	(0.010)*	(0.010)*	(0.010)*	(0.010)*
Log of Establishments per Square Mile in the Zip Code	0.020	0.020	0.020	0.019
	(0.030)	(0.030)	(0.030)	(0.030)
Log of Employment per Square Mile in the Zip Code	-0.030	-0.030	-0.030	-0.030
	(0.019)	(0.019)	(0.019)	(0.019)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.022	0.022	0.022	0.022
	(0.044)	(0.044)	(0.044)	(0.044)
DOCSIS 3.0 Available in the Census Block		-0.013		
		(0.010)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.004	
			(0.008)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				0.003
				(0.008)
Constant	5.392	5.405	5.395	5.389
	(0.227)*	(0.227)*	(0.227)*	(0.228)*
Adjusted R-Squared	0.29	0.29	0.29	0.29
F Statistic	122.73	110.78	110.92	111.85
Observations	679,520	679,520	679,520	679,520

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 1.3c: Regression of Log of ILEC DS-1 Price on Competition in the Building, Block, and Tract including Cable Indicators
Phase II Areas

	DS-1	DS-1	DS-1	DS-1
A Facilities-based Competitor is in the Building	-0.064	-0.064	-0.064	-0.064
	(0.013)*	(0.013)*	(0.013)*	(0.013)*
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.032	-0.031	-0.032	-0.032
	(0.011)*	(0.011)*	(0.011)*	(0.012)*
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.038	-0.037	-0.038	-0.038
	(0.015)*	(0.015)*	(0.015)*	(0.015)*
Customer is a Telecommunications Provider	-0.087	-0.087	-0.087	-0.087
	(0.016)*	(0.016)*	(0.016)*	(0.016)*
Customer is a Mobile Telecommunications Provider	0.098	0.098	0.098	0.098
	(0.010)*	(0.010)*	(0.010)*	(0.010)*
Customer is a Cable Operator	-0.069	-0.069	-0.069	-0.069
	(0.011)*	(0.011)*	(0.011)*	(0.011)*
Log of Establishments per Square Mile in the Zip Code	0.020	0.020	0.020	0.020
	(0.023)	(0.023)	(0.023)	(0.023)
Log of Employment per Square Mile in the Zip Code	-0.014	-0.013	-0.014	-0.014
	(0.018)	(0.018)	(0.018)	(0.018)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.068	0.067	0.068	0.068
	(0.034)*	(0.034)*	(0.034)*	(0.034)*
DOCSIS 3.0 Available in the Census Block		-0.028		
		(0.016)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.007	
			(0.014)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.006
				(0.016)
Constant	5.051	5.075	5.057	5.055
	(0.142)*	(0.141)*	(0.140)*	(0.140)*
Adjusted R-Squared	0.38	0.38	0.38	0.38
F Statistic	39.12	35.82	35.57	35.55
Observations	548,020	548,020	548,020	548,020

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 2.1a: Regression of Log of ILEC DS-3 Price on Competition in the Block including Cable Indicators
Price Cap Areas

	DS-3	DS-3	DS-3	DS-3
A Facilities-based Competitor is in the Census Block	0.055	0.050	0.056	0.056
	(0.044)	(0.044)	(0.044)	(0.044)
Customer is a Telecommunications Provider	-0.132	-0.128	-0.133	-0.133
	(0.070)	(0.070)	(0.070)	(0.070)
Customer is a Mobile Telecommunications Provider	0.094	0.094	0.094	0.094
	(0.051)	(0.051)	(0.051)	(0.051)
Customer is a Cable Operator	0.085	0.086	0.085	0.086
	(0.075)	(0.075)	(0.075)	(0.075)
Log of Establishments per Square Mile in the Zip Code	0.001	0.000	0.000	-0.001
	(0.123)	(0.122)	(0.123)	(0.123)
Log of Employment per Square Mile in the Zip Code	0.029	0.027	0.030	0.030
	(0.091)	(0.091)	(0.091)	(0.091)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	-0.441	-0.451	-0.441	-0.439
	(0.180)*	(0.180)*	(0.180)*	(0.180)*
DOCSIS 3.0 Available in the Census Block		0.130		
		(0.067)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.014	
			(0.063)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.029
				(0.063)
Constant	8.236	8.188	8.240	8.239
	(0.710)*	(0.711)*	(0.711)*	(0.710)*
Adjusted R-Squared	0.42	0.42	0.42	0.42
F Statistic	2.03	2.28	1.78	1.79
Observations	27,253	27,253	27,253	27,253

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 2.1b: Regression of Log of ILEC DS-3 Price on Competition in the Block including Cable Indicators
Phase I Areas

	DS-3	DS-3	DS-3	DS-3
A Facilities-based Competitor is in the Census Block	-0.028	0.012	-0.008	-0.026
	(0.063)	(0.065)	(0.064)	(0.063)
Customer is a Telecommunications Provider	-0.034	-0.037	-0.039	-0.034
	(0.064)	(0.064)	(0.064)	(0.064)
Customer is a Mobile Telecommunications Provider	0.248	0.247	0.248	0.248
	(0.058)*	(0.059)*	(0.058)*	(0.058)*
Customer is a Cable Operator	-0.116	-0.113	-0.115	-0.117
	(0.077)	(0.076)	(0.077)	(0.077)
Log of Establishments per Square Mile in the Zip Code	0.127	0.133	0.137	0.129
	(0.161)	(0.169)	(0.166)	(0.162)
Log of Employment per Square Mile in the Zip Code	0.003	-0.017	-0.015	0.000
	(0.147)	(0.157)	(0.153)	(0.148)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.557	0.577	0.578	0.560
	(0.196)*	(0.201)*	(0.198)*	(0.196)*
DOCSIS 3.0 Available in the Census Block		-0.422		
		(0.181)*		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.270	
			(0.186)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.027
				(0.089)
Constant	3.384	3.779	3.583	3.396
	(0.808)*	(0.842)*	(0.828)*	(0.813)*
Adjusted R-Squared	0.24	0.25	0.25	0.24
F Statistic	5.85	5.55	5.24	5.20
Observations	58,790	58,790	58,790	58,790

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 2.1c: Regression of Log of ILEC DS-3 Price on Competition in the Block including Cable Indicators
Phase II Areas

	DS-3	DS-3	DS-3	DS-3
A Facilities-based Competitor is in the Census Block	-0.209	-0.216	-0.215	-0.216
	(0.056)*	(0.057)*	(0.057)*	(0.057)*
Customer is a Telecommunications Provider	0.086	0.086	0.086	0.086
	(0.059)	(0.059)	(0.059)	(0.059)
Customer is a Mobile Telecommunications Provider	0.223	0.221	0.222	0.222
	(0.100)*	(0.100)*	(0.100)*	(0.100)*
Customer is a Cable Operator	-0.036	-0.035	-0.035	-0.035
	(0.045)	(0.045)	(0.045)	(0.045)
Log of Establishments per Square Mile in the Zip Code	-0.108	-0.102	-0.104	-0.104
	(0.090)	(0.088)	(0.089)	(0.090)
Log of Employment per Square Mile in the Zip Code	0.156	0.150	0.153	0.154
	(0.078)*	(0.077)	(0.078)*	(0.078)*
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	-0.069	-0.056	-0.050	-0.053
	(0.171)	(0.168)	(0.170)	(0.170)
DOCSIS 3.0 Available in the Census Block		0.164		
		(0.092)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			0.130	
			(0.080)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				0.110
				(0.082)
Constant	6.171	5.987	5.993	6.031
	(0.592)*	(0.580)*	(0.589)*	(0.590)*
Adjusted R-Squared	0.27	0.27	0.27	0.27
F Statistic	3.88	3.89	3.81	3.66
Observations	52,115	52,115	52,115	52,115

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 2.2a: Regression of Log of ILEC DS-3 Price on Competition and Fiber in the Block including Cable Indicators
Price Cap Areas

	DS-3	DS-3	DS-3	DS-3
A Facilities-based Competitor is in the Census Block	0.060	0.055	0.060	0.060
	(0.044)	(0.044)	(0.044)	(0.044)
An Indep. CLEC Has a Fiber Network in the Census Block	-0.054	-0.061	-0.053	-0.052
	(0.048)	(0.048)	(0.048)	(0.048)
Customer is a Telecommunications Provider	-0.134	-0.129	-0.134	-0.134
	(0.070)	(0.070)	(0.070)	(0.070)
Customer is a Mobile Telecommunications Provider	0.094	0.094	0.094	0.094
	(0.051)	(0.051)	(0.051)	(0.051)
Customer is a Cable Operator	0.086	0.087	0.086	0.086
	(0.075)	(0.075)	(0.075)	(0.075)
Log of Establishments per Square Mile in the Zip Code	0.000	-0.000	-0.000	-0.001
	(0.122)	(0.121)	(0.122)	(0.122)
Log of Employment per Square Mile in the Zip Code	0.029	0.027	0.030	0.030
	(0.091)	(0.090)	(0.091)	(0.091)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	-0.440	-0.450	-0.440	-0.438
	(0.179)*	(0.179)*	(0.180)*	(0.180)*
DOCSIS 3.0 Available in the Census Block		0.136		
		(0.068)*		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.007	
			(0.063)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.022
				(0.063)
Constant	8.271	8.226	8.273	8.273
	(0.710)*	(0.709)*	(0.710)*	(0.709)*
Adjusted R-Squared	0.42	0.42	0.42	0.42
F Statistic	1.89	2.13	1.68	1.69
Observations	27,253	27,253	27,253	27,253

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 2.2b: Regression of Log of ILEC DS-3 Price on Competition and Fiber in the Block including Cable Indicators
Phase I Areas

	DS-3	DS-3	DS-3	DS-3
A Facilities-based Competitor is in the Census Block	-0.017	0.017	-0.001	-0.016
	(0.064)	(0.065)	(0.065)	(0.065)
An Indep. CLEC Has a Fiber Network in the Census Block	-0.159	-0.090	-0.114	-0.156
	(0.082)	(0.087)	(0.085)	(0.082)
Customer is a Telecommunications Provider	-0.034	-0.037	-0.039	-0.034
	(0.064)	(0.064)	(0.064)	(0.064)
Customer is a Mobile Telecommunications Provider	0.249	0.247	0.248	0.249
	(0.058)*	(0.059)*	(0.059)*	(0.058)*
Customer is a Cable Operator	-0.116	-0.113	-0.115	-0.116
	(0.077)	(0.076)	(0.077)	(0.077)
Log of Establishments per Square Mile in the Zip Code	0.125	0.132	0.136	0.127
	(0.161)	(0.169)	(0.166)	(0.162)
Log of Employment per Square Mile in the Zip Code	0.002	-0.018	-0.015	0.000
	(0.147)	(0.157)	(0.153)	(0.148)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.562	0.580	0.582	0.564
	(0.196)*	(0.201)*	(0.198)*	(0.195)*
DOCSIS 3.0 Available in the Census Block		-0.417		
		(0.182)*		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.265	
			(0.187)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.020
				(0.089)
Constant	3.520	3.851	3.677	3.526
	(0.801)*	(0.831)*	(0.817)*	(0.804)*
Adjusted R-Squared	0.24	0.25	0.25	0.24
F Statistic	5.48	5.22	4.97	4.92
Observations	58,790	58,790	58,790	58,790

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 2.2c: Regression of Log of ILEC DS-3 Price on Competition and Fiber in the Block including Cable Indicators
Phase II Areas

	DS-3	DS-3	DS-3	DS-3
A Facilities-based Competitor is in the Census Block	-0.210	-0.215	-0.214	-0.215
	(0.058)*	(0.058)*	(0.058)*	(0.058)*
An Indep. CLEC Has a Fiber Network in the Census Block	0.006	-0.007	-0.005	-0.004
	(0.070)	(0.071)	(0.071)	(0.071)
Customer is a Telecommunications Provider	0.086	0.086	0.086	0.086
	(0.059)	(0.059)	(0.059)	(0.059)
Customer is a Mobile Telecommunications Provider	0.223	0.221	0.222	0.222
	(0.100)*	(0.100)*	(0.100)*	(0.100)*
Customer is a Cable Operator	-0.036	-0.035	-0.035	-0.035
	(0.045)	(0.045)	(0.045)	(0.045)
Log of Establishments per Square Mile in the Zip Code	-0.108	-0.102	-0.104	-0.104
	(0.090)	(0.088)	(0.090)	(0.090)
Log of Employment per Square Mile in the Zip Code	0.156	0.150	0.153	0.154
	(0.078)*	(0.077)	(0.078)*	(0.078)*
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	-0.069	-0.056	-0.050	-0.053
	(0.171)	(0.168)	(0.170)	(0.170)
DOCSIS 3.0 Available in the Census Block		0.165		
		(0.093)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			0.130	
			(0.080)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				0.110
				(0.083)
Constant	6.165	5.993	5.998	6.034
	(0.594)*	(0.581)*	(0.590)*	(0.591)*
Adjusted R-Squared	0.27	0.27	0.27	0.27
F Statistic	3.43	3.48	3.42	3.29
Observations	52,115	52,115	52,115	52,115

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 2.3a: Regression of Log of ILEC DS-3 Price on Competition in the Building, Block, and Tract including Cable Indicators
Price Cap Areas

	DS-3	DS-3	DS-3	DS-3
A Facilities-based Competitor is in the Building	0.098	0.095	0.098	0.098
	(0.075)	(0.075)	(0.075)	(0.075)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.047	-0.048	-0.047	-0.047
	(0.072)	(0.072)	(0.072)	(0.072)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.092	-0.081	-0.094	-0.095
	(0.069)	(0.071)	(0.070)	(0.070)
Customer is a Telecommunications Provider	-0.128	-0.124	-0.129	-0.129
	(0.071)	(0.071)	(0.071)	(0.071)
Customer is a Mobile Telecommunications Provider	0.095	0.095	0.095	0.095
	(0.051)	(0.051)	(0.051)	(0.051)
Customer is a Cable Operator	0.088	0.089	0.089	0.089
	(0.074)	(0.074)	(0.074)	(0.074)
Log of Establishments per Square Mile in the Zip Code	0.003	0.002	0.002	0.001
	(0.122)	(0.121)	(0.122)	(0.122)
Log of Employment per Square Mile in the Zip Code	0.028	0.026	0.029	0.029
	(0.091)	(0.091)	(0.091)	(0.091)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	-0.445	-0.453	-0.443	-0.442
	(0.180)*	(0.180)*	(0.180)*	(0.180)*
DOCSIS 3.0 Available in the Census Block		0.124		
		(0.069)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.018	
			(0.064)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.033
				(0.065)
Constant	8.336	8.280	8.343	8.343
	(0.714)*	(0.715)*	(0.714)*	(0.714)*
Adjusted R-Squared	0.42	0.42	0.42	0.42
F Statistic	1.91	2.02	1.72	1.74
Observations	27,253	27,253	27,253	27,253

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 2.3b: Regression of Log of ILEC DS-3 Price on Competition in the Building, Block, and Tract including Cable Indicators
Phase I Areas

	DS-3	DS-3	DS-3	DS-3
A Facilities-based Competitor is in the Building	-0.045	-0.029	-0.040	-0.045
	(0.081)	(0.081)	(0.081)	(0.081)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.127	-0.072	-0.100	-0.126
	(0.100)	(0.076)	(0.081)	(0.100)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.273	-0.266	-0.267	-0.273
	(0.125)*	(0.120)*	(0.122)*	(0.125)*
Customer is a Telecommunications Provider	-0.040	-0.041	-0.044	-0.040
	(0.064)	(0.064)	(0.064)	(0.064)
Customer is a Mobile Telecommunications Provider	0.246	0.245	0.246	0.246
	(0.059)*	(0.059)*	(0.059)*	(0.059)*
Customer is a Cable Operator	-0.114	-0.112	-0.114	-0.114
	(0.077)	(0.076)	(0.076)	(0.077)
Log of Establishments per Square Mile in the Zip Code	0.151	0.152	0.158	0.153
	(0.161)	(0.169)	(0.166)	(0.162)
Log of Employment per Square Mile in the Zip Code	0.004	-0.015	-0.012	0.002
	(0.149)	(0.158)	(0.154)	(0.150)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.569	0.579	0.585	0.571
	(0.200)*	(0.204)*	(0.202)*	(0.200)*
DOCSIS 3.0 Available in the Census Block		-0.398		
		(0.162)*		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.248	
			(0.167)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.015
				(0.088)
Constant	3.516	3.928	3.713	3.523
	(0.859)*	(0.877)*	(0.867)*	(0.862)*
Adjusted R-Squared	0.25	0.25	0.25	0.25
F Statistic	4.73	4.56	4.29	4.28
Observations	58,790	58,790	58,790	58,790

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 2.3c: Regression of Log of ILEC DS-3 Price on Competition in the Building, Block, and Tract including Cable Indicators
Phase II Areas

	DS-3	DS-3	DS-3	DS-3
A Facilities-based Competitor is in the Building	-0.150	-0.146	-0.146	-0.148
	(0.059)*	(0.059)*	(0.059)*	(0.059)*
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.098	-0.105	-0.106	-0.105
	(0.079)	(0.079)	(0.080)	(0.080)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.174	-0.169	-0.168	-0.170
	(0.117)	(0.117)	(0.117)	(0.117)
Customer is a Telecommunications Provider	0.088	0.088	0.088	0.088
	(0.059)	(0.059)	(0.059)	(0.059)
Customer is a Mobile Telecommunications Provider	0.224	0.223	0.223	0.224
	(0.100)*	(0.100)*	(0.100)*	(0.100)*
Customer is a Cable Operator	-0.033	-0.033	-0.033	-0.033
	(0.046)	(0.046)	(0.046)	(0.046)
Log of Establishments per Square Mile in the Zip Code	-0.107	-0.102	-0.103	-0.104
	(0.090)	(0.089)	(0.090)	(0.090)
Log of Employment per Square Mile in the Zip Code	0.146	0.141	0.144	0.144
	(0.078)	(0.078)	(0.078)	(0.078)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	-0.041	-0.029	-0.022	-0.026
	(0.175)	(0.173)	(0.175)	(0.175)
DOCSIS 3.0 Available in the Census Block		0.142		
		(0.092)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			0.115	
			(0.081)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				0.093
				(0.083)
Constant	6.251	6.081	6.081	6.123
	(0.633)*	(0.624)*	(0.633)*	(0.634)*
Adjusted R-Squared	0.27	0.27	0.27	0.27
F Statistic	2.20	2.27	2.19	2.09
Observations	52,115	52,115	52,115	52,115

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 3.1a: Regression of Log of ILEC High Bandwidth Price on Competition in the Block including Cable Indicators
Price Cap Areas

	High Band	High Band	High Band	High Band
A Facilities-based Competitor is in the Census Block	0.082	0.085	0.090	0.089
	(0.037)*	(0.037)*	(0.037)*	(0.037)*
Customer is a Telecommunications Provider	0.193	0.193	0.194	0.194
	(0.049)*	(0.049)*	(0.049)*	(0.049)*
Customer is a Mobile Telecommunications Provider	-0.203	-0.203	-0.204	-0.203
	(0.035)*	(0.035)*	(0.035)*	(0.035)*
Customer is a Cable Operator	-0.099	-0.097	-0.092	-0.092
	(0.216)	(0.215)	(0.216)	(0.216)
Log of Establishments per Square Mile in the Zip Code	0.150	0.151	0.154	0.153
	(0.175)	(0.175)	(0.175)	(0.175)
Log of Employment per Square Mile in the Zip Code	-0.084	-0.083	-0.085	-0.085
	(0.157)	(0.157)	(0.157)	(0.157)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	-0.106	-0.104	-0.100	-0.102
	(0.130)	(0.130)	(0.131)	(0.131)
Natural Log of Mbps	0.102	0.102	0.102	0.102
	(0.034)*	(0.034)*	(0.034)*	(0.034)*
Packet-based Connection	-1.353	-1.354	-1.353	-1.353
	(0.119)*	(0.119)*	(0.119)*	(0.119)*
DOCSIS 3.0 Available in the Census Block		-0.044		
		(0.041)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.097	
			(0.042)*	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.103
				(0.050)*
Constant	7.723	7.740	7.753	7.753
	(0.699)*	(0.699)*	(0.700)*	(0.700)*
Adjusted R-Squared	0.71	0.71	0.71	0.71
F Statistic	24.31	21.88	22.32	22.22
Observations	30,553	30,553	30,553	30,553

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects
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Table 3.1b: Regression of Log of ILEC High Bandwidth Price on Competition in the Block including Cable Indicators
Phase I Areas

	High Band	High Band	High Band	High Band
A Facilities-based Competitor is in the Census Block	0.003	0.013	0.010	0.010
	(0.037)	(0.036)	(0.037)	(0.037)
Customer is a Telecommunications Provider	0.005	0.004	0.005	0.005
	(0.056)	(0.056)	(0.056)	(0.056)
Customer is a Mobile Telecommunications Provider	-0.132	-0.132	-0.132	-0.132
	(0.148)	(0.148)	(0.148)	(0.148)
Customer is a Cable Operator	-0.117	-0.116	-0.116	-0.116
	(0.250)	(0.250)	(0.250)	(0.250)
Log of Establishments per Square Mile in the Zip Code	-0.297	-0.298	-0.294	-0.292
	(0.109)*	(0.110)*	(0.110)*	(0.110)*
Log of Employment per Square Mile in the Zip Code	0.221	0.221	0.219	0.219
	(0.097)*	(0.098)*	(0.098)*	(0.098)*
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.007	0.005	0.008	0.009
	(0.168)	(0.168)	(0.168)	(0.168)
Natural Log of Mbps	0.236	0.237	0.236	0.237
	(0.074)*	(0.074)*	(0.074)*	(0.074)*
Packet-based Connection	-0.020	-0.018	-0.018	-0.019
	(0.077)	(0.077)	(0.077)	(0.077)
DOCSIS 3.0 Available in the Census Block		-0.103		
		(0.060)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.065	
			(0.038)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.059
				(0.038)
Constant	5.647	5.750	5.686	5.666
	(0.734)*	(0.732)*	(0.735)*	(0.734)*
Adjusted R-Squared	0.41	0.41	0.41	0.41
F Statistic	11.53	11.20	11.20	11.05
Observations	48,499	48,499	48,499	48,499

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 3.1c: Regression of Log of ILEC High Bandwidth Price on Competition in the Block including Cable Indicators
Phase II Areas

	High Band	High Band	High Band	High Band
A Facilities-based Competitor is in the Census Block	-0.002	-0.002	-0.001	-0.001
	(0.036)	(0.037)	(0.036)	(0.036)
Customer is a Telecommunications Provider	0.497	0.497	0.496	0.496
	(0.090)*	(0.090)*	(0.090)*	(0.090)*
Customer is a Mobile Telecommunications Provider	-0.324	-0.324	-0.324	-0.324
	(0.058)*	(0.058)*	(0.058)*	(0.058)*
Customer is a Cable Operator	-0.679	-0.678	-0.678	-0.678
	(0.323)*	(0.323)*	(0.323)*	(0.323)*
Log of Establishments per Square Mile in the Zip Code	-0.039	-0.039	-0.038	-0.038
	(0.150)	(0.149)	(0.149)	(0.149)
Log of Employment per Square Mile in the Zip Code	0.032	0.032	0.032	0.032
	(0.138)	(0.137)	(0.138)	(0.138)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.113	0.113	0.114	0.113
	(0.165)	(0.166)	(0.166)	(0.166)
Natural Log of Mbps	0.397	0.397	0.397	0.397
	(0.021)*	(0.021)*	(0.021)*	(0.021)*
Packet-based Connection	-0.217	-0.218	-0.217	-0.217
	(0.164)	(0.164)	(0.164)	(0.164)
DOCSIS 3.0 Available in the Census Block		0.017		
		(0.076)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.027	
			(0.057)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.019
				(0.056)
Constant	4.680	4.667	4.695	4.689
	(0.585)*	(0.610)*	(0.604)*	(0.601)*
Adjusted R-Squared	0.48	0.48	0.48	0.48
F Statistic	79.20	71.30	72.84	73.16
Observations	21,461	21,461	21,461	21,461

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 3.2a: Regression of Log of ILEC High Bandwidth Price on Competition and Fiber in the Block including Cable Indicators
Price Cap Areas

	High Band	High Band	High Band	High Band
A Facilities-based Competitor is in the Census Block	0.081	0.083	0.087	0.087
	(0.037)*	(0.038)*	(0.038)*	(0.038)*
An Indep. CLEC Has a Fiber Network in the Census Block	0.006	0.010	0.012	0.012
	(0.031)	(0.032)	(0.032)	(0.032)
Customer is a Telecommunications Provider	0.194	0.193	0.194	0.194
	(0.049)*	(0.049)*	(0.049)*	(0.049)*
Customer is a Mobile Telecommunications Provider	-0.203	-0.204	-0.204	-0.204
	(0.035)*	(0.035)*	(0.035)*	(0.035)*
Customer is a Cable Operator	-0.100	-0.099	-0.095	-0.094
	(0.216)	(0.215)	(0.216)	(0.216)
Log of Establishments per Square Mile in the Zip Code	0.150	0.151	0.154	0.154
	(0.175)	(0.175)	(0.175)	(0.175)
Log of Employment per Square Mile in the Zip Code	-0.084	-0.084	-0.086	-0.086
	(0.157)	(0.157)	(0.157)	(0.157)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	-0.107	-0.104	-0.101	-0.102
	(0.130)	(0.130)	(0.131)	(0.131)
Natural Log of Mbps	0.102	0.102	0.102	0.102
	(0.034)*	(0.034)*	(0.034)*	(0.034)*
Packet-based Connection	-1.353	-1.354	-1.353	-1.353
	(0.119)*	(0.119)*	(0.119)*	(0.119)*
DOCSIS 3.0 Available in the Census Block		-0.046		
		(0.042)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.099	
			(0.042)*	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.105
				(0.050)*
Constant	7.722	7.738	7.751	7.751
	(0.701)*	(0.700)*	(0.701)*	(0.702)*
Adjusted R-Squared	0.71	0.71	0.71	0.71
F Statistic	21.89	19.90	20.31	20.22
Observations	30,553	30,553	30,553	30,553

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 3.2b: Regression of Log of ILEC High Bandwidth Price on Competition and Fiber in the Block including Cable Indicators
Phase I Areas

	High Band	High Band	High Band	High Band
A Facilities-based Competitor is in the Census Block	0.005	0.013	0.011	0.011
	(0.037)	(0.037)	(0.037)	(0.037)
An Indep. CLEC Has a Fiber Network in the Census Block	-0.017	-0.008	-0.011	-0.012
	(0.058)	(0.059)	(0.059)	(0.059)
Customer is a Telecommunications Provider	0.005	0.005	0.005	0.005
	(0.056)	(0.056)	(0.056)	(0.056)
Customer is a Mobile Telecommunications Provider	-0.132	-0.132	-0.132	-0.132
	(0.148)	(0.148)	(0.148)	(0.148)
Customer is a Cable Operator	-0.117	-0.116	-0.115	-0.116
	(0.250)	(0.250)	(0.250)	(0.250)
Log of Establishments per Square Mile in the Zip Code	-0.296	-0.298	-0.294	-0.292
	(0.109)*	(0.110)*	(0.110)*	(0.110)*
Log of Employment per Square Mile in the Zip Code	0.221	0.221	0.219	0.219
	(0.097)*	(0.098)*	(0.098)*	(0.098)*
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.008	0.006	0.008	0.009
	(0.168)	(0.168)	(0.168)	(0.168)
Natural Log of Mbps	0.236	0.237	0.237	0.237
	(0.074)*	(0.074)*	(0.074)*	(0.074)*
Packet-based Connection	-0.020	-0.018	-0.018	-0.019
	(0.077)	(0.077)	(0.077)	(0.077)
DOCSIS 3.0 Available in the Census Block		-0.103		
		(0.061)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.065	
			(0.038)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.058
				(0.038)
Constant	5.660	5.756	5.695	5.676
	(0.736)*	(0.734)*	(0.737)*	(0.736)*
Adjusted R-Squared	0.41	0.41	0.41	0.41
F Statistic	10.38	10.18	10.18	10.05
Observations	48,499	48,499	48,499	48,499

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 3.2c: Regression of Log of ILEC High Bandwidth Price on Competition and Fiber in the Block including Cable Indicators
Phase II Areas

	High Band	High Band	High Band	High Band
A Facilities-based Competitor is in the Census Block	0.007	0.007	0.008	0.008
	(0.037)	(0.037)	(0.037)	(0.037)
An Indep. CLEC Has a Fiber Network in the Census Block	-0.082	-0.083	-0.081	-0.082
	(0.044)	(0.044)	(0.044)	(0.044)
Customer is a Telecommunications Provider	0.498	0.498	0.497	0.497
	(0.090)*	(0.090)*	(0.090)*	(0.090)*
Customer is a Mobile Telecommunications Provider	-0.324	-0.324	-0.324	-0.324
	(0.058)*	(0.058)*	(0.058)*	(0.058)*
Customer is a Cable Operator	-0.673	-0.673	-0.673	-0.673
	(0.324)*	(0.324)*	(0.324)*	(0.324)*
Log of Establishments per Square Mile in the Zip Code	-0.043	-0.043	-0.042	-0.042
	(0.151)	(0.151)	(0.151)	(0.151)
Log of Employment per Square Mile in the Zip Code	0.036	0.036	0.036	0.036
	(0.139)	(0.139)	(0.140)	(0.140)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.106	0.107	0.107	0.106
	(0.167)	(0.168)	(0.167)	(0.168)
Natural Log of Mbps	0.397	0.397	0.397	0.397
	(0.021)*	(0.021)*	(0.021)*	(0.021)*
Packet-based Connection	-0.216	-0.216	-0.216	-0.216
	(0.164)	(0.164)	(0.164)	(0.164)
DOCSIS 3.0 Available in the Census Block		0.020		
		(0.076)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.025	
			(0.057)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.016
				(0.056)
Constant	4.760	4.745	4.772	4.767
	(0.589)*	(0.611)*	(0.606)*	(0.603)*
Adjusted R-Squared	0.48	0.48	0.48	0.48
F Statistic	71.84	65.32	66.76	67.08
Observations	21,461	21,461	21,461	21,461

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 3.3a: Regression of Log of ILEC High Bandwidth Price on Competition in the Building, Block, and Tract including Cable Indicators
Price Cap Areas

	High Band	High Band	High Band	High Band
A Facilities-based Competitor is in the Building	0.114	0.116	0.117	0.117
	(0.059)	(0.059)	(0.059)*	(0.059)*
At Least One Facilities-based Competitor is in the Block But Not the Building	0.052	0.054	0.057	0.056
	(0.044)	(0.044)	(0.044)	(0.044)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.013	-0.013	-0.015	-0.016
	(0.068)	(0.068)	(0.068)	(0.068)
Customer is a Telecommunications Provider	0.193	0.193	0.194	0.194
	(0.049)*	(0.049)*	(0.049)*	(0.049)*
Customer is a Mobile Telecommunications Provider	-0.202	-0.203	-0.204	-0.203
	(0.035)*	(0.035)*	(0.034)*	(0.034)*
Customer is a Cable Operator	-0.105	-0.103	-0.099	-0.098
	(0.216)	(0.215)	(0.216)	(0.216)
Log of Establishments per Square Mile in the Zip Code	0.149	0.150	0.152	0.152
	(0.175)	(0.175)	(0.175)	(0.175)
Log of Employment per Square Mile in the Zip Code	-0.084	-0.083	-0.085	-0.085
	(0.157)	(0.157)	(0.157)	(0.157)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	-0.107	-0.105	-0.101	-0.102
	(0.131)	(0.131)	(0.131)	(0.131)
Natural Log of Mbps	0.101	0.101	0.101	0.101
	(0.034)*	(0.034)*	(0.034)*	(0.034)*
Packet-based Connection	-1.352	-1.353	-1.352	-1.352
	(0.119)*	(0.119)*	(0.119)*	(0.119)*
DOCSIS 3.0 Available in the Census Block		-0.043		
		(0.041)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.095	
			(0.042)*	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.101
				(0.049)*
Constant	7.733	7.750	7.764	7.764
	(0.697)*	(0.697)*	(0.697)*	(0.698)*
Adjusted R-Squared	0.71	0.71	0.71	0.71
F Statistic	20.21	18.53	18.87	18.79
Observations	30,553	30,553	30,553	30,553

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 3.3b: Regression of Log of ILEC High Bandwidth Price on Competition in the Building, Block, and Tract including Cable Indicators
Phase I Areas

	High Band	High Band	High Band	High Band
A Facilities-based Competitor is in the Building	-0.002	0.004	0.000	0.000
	(0.044)	(0.044)	(0.044)	(0.044)
At Least One Facilities-based Competitor is in the Block But Not the Building	-0.013	-0.005	-0.007	-0.008
	(0.034)	(0.034)	(0.034)	(0.034)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.078	-0.074	-0.079	-0.079
	(0.053)	(0.053)	(0.053)	(0.053)
Customer is a Telecommunications Provider	0.005	0.005	0.005	0.005
	(0.056)	(0.056)	(0.056)	(0.056)
Customer is a Mobile Telecommunications Provider	-0.132	-0.132	-0.132	-0.132
	(0.148)	(0.148)	(0.148)	(0.148)
Customer is a Cable Operator	-0.117	-0.115	-0.115	-0.115
	(0.250)	(0.250)	(0.250)	(0.250)
Log of Establishments per Square Mile in the Zip Code	-0.296	-0.298	-0.294	-0.292
	(0.108)*	(0.109)*	(0.109)*	(0.109)*
Log of Employment per Square Mile in the Zip Code	0.221	0.222	0.220	0.220
	(0.097)*	(0.098)*	(0.098)*	(0.098)*
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.012	0.007	0.011	0.012
	(0.169)	(0.168)	(0.168)	(0.168)
Natural Log of Mbps	0.236	0.237	0.236	0.236
	(0.074)*	(0.074)*	(0.074)*	(0.074)*
Packet-based Connection	-0.020	-0.018	-0.019	-0.019
	(0.077)	(0.077)	(0.077)	(0.077)
DOCSIS 3.0 Available in the Census Block		-0.101		
		(0.061)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.064	
			(0.038)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.058
				(0.038)
Constant	5.702	5.804	5.744	5.725
	(0.742)*	(0.739)*	(0.743)*	(0.742)*
Adjusted R-Squared	0.41	0.41	0.41	0.41
F Statistic	9.78	9.67	9.63	9.55
Observations	48,499	48,499	48,499	48,499

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects

Table 3.3c: Regression of Log of ILEC High Bandwidth Price on Competition in the Building, Block, and Tract including Cable Indicators
Phase II Areas

	High Band	High Band	High Band	High Band
A Facilities-based Competitor is in the Building	-0.058	-0.058	-0.059	-0.059
	(0.043)	(0.043)	(0.043)	(0.043)
At Least One Facilities-based Competitor is in the Block But Not the Building	0.044	0.043	0.044	0.044
	(0.044)	(0.044)	(0.044)	(0.044)
At Least One Facilities-based Competitor is in the Tract But Not the Block	-0.039	-0.039	-0.040	-0.040
	(0.051)	(0.051)	(0.051)	(0.051)
Customer is a Telecommunications Provider	0.496	0.497	0.496	0.496
	(0.090)*	(0.090)*	(0.090)*	(0.090)*
Customer is a Mobile Telecommunications Provider	-0.325	-0.325	-0.325	-0.325
	(0.058)*	(0.058)*	(0.058)*	(0.058)*
Customer is a Cable Operator	-0.679	-0.679	-0.679	-0.679
	(0.324)*	(0.324)*	(0.324)*	(0.324)*
Log of Establishments per Square Mile in the Zip Code	-0.033	-0.033	-0.032	-0.032
	(0.148)	(0.148)	(0.148)	(0.148)
Log of Employment per Square Mile in the Zip Code	0.029	0.029	0.029	0.029
	(0.136)	(0.136)	(0.136)	(0.136)
Log of Average Annual Wage ($1,000) of Employees in the Zip Code	0.109	0.110	0.110	0.109
	(0.165)	(0.165)	(0.165)	(0.165)
Natural Log of Mbps	0.398	0.398	0.398	0.398
	(0.021)*	(0.021)*	(0.021)*	(0.021)*
Packet-based Connection	-0.219	-0.219	-0.219	-0.219
	(0.164)	(0.164)	(0.164)	(0.164)
DOCSIS 3.0 Available in the Census Block		0.012		
		(0.077)		
Metro Ethernet Cable Headend serves the Census Block (Expansive Definition)			-0.033	
			(0.058)	
Metro Ethernet Cable Headend serves the Census Block (Narrow Definition)				-0.025
				(0.057)
Constant	4.720	4.711	4.741	4.735
	(0.594)*	(0.621)*	(0.616)*	(0.614)*
Adjusted R-Squared	0.48	0.48	0.48	0.48
F Statistic	66.32	60.85	61.84	61.95
Observations	21,461	21,461	21,461	21,461

* $p<0.05$
Standard errors in parentheses allow for correlated error terms within a census block
Census Tract Fixed Effects